



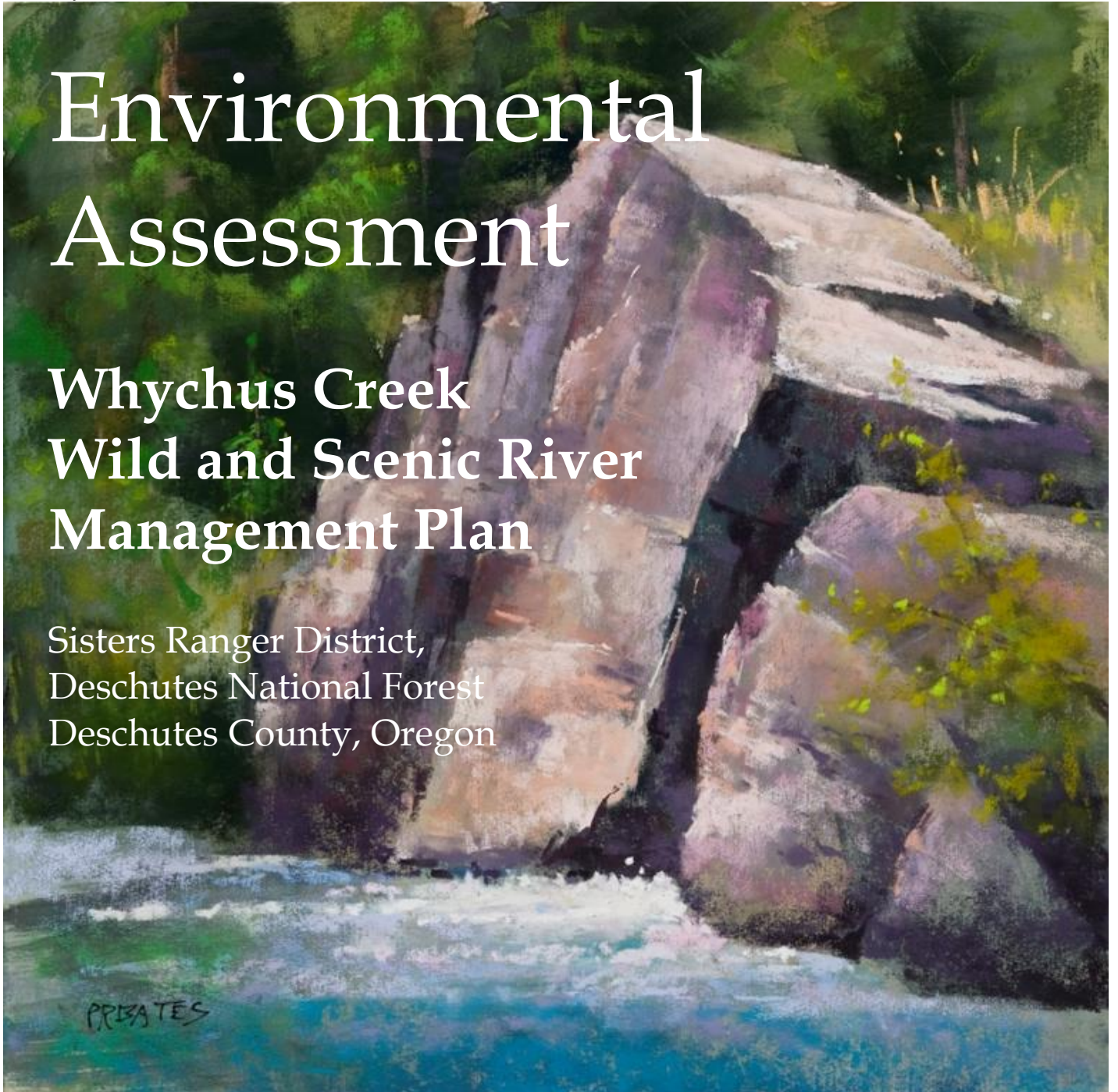
United States Department of Agriculture
Forest Service

January 2010

Environmental Assessment

Whychus Creek Wild and Scenic River Management Plan

Sisters Ranger District,
Deschutes National Forest
Deschutes County, Oregon



Environmental Assessment

Whychus Creek Wild and Scenic River Management Plan

Sisters Ranger District,
Deschutes National Forest
Deschutes County, Oregon

For More Information Contact: Maret Pajutee, Project Leader, Sisters Ranger District
541-549-7727, mpajutee@fs.fed.us or view project information at:
<http://www.fs.fed.us/r6/centraloregon/projects/units/sisters/index.shtml>

Art and Photo Credits

Plein Air Art from the "Whychus Paint-Out" - Used by permission of: The National Forest Foundation, The Roundhouse Foundation, and the artists.

- 🎨 *Cover Artwork- By Phil Bates, One of Best of Show at the 2009 Whychus Paint-Out*
- 🎨 *Janet Guiley, Poster Award at the 2009 Whychus Paint-Out*
- 🎨 *Donna Simpson, One of Best of Show at the 2009 Whychus Paint-Out*
- 🎨 *Kay Baker, One of Best of Show at the 2009 Whychus Paint-Out*
- 🎨 *Jerry Dame, One of Best of Show, purchased by NFF at the 2009 Whychus Paint-Out*

Photographs- by Bill Anthony, Tay Robertson, Maret Pajutee, Cari Press, Ross Scrocca, Larry Chitwood, John Schubert, and Scott Cotter

Riparian/Fish/Wildlife Habitat illustrations from "Respect The River" materials

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Table of Contents

Summary	i
Chapter 1-Introduction	1
Background	3
Resource Assessment	5
Outstandingly Remarkable Values	6
Name Changes	7
Management Direction.....	9
Analysis Incorporated by Reference	17
Purpose and Need for Action.....	19
Desired Future Condition, Existing Condition, and Need	21
Geology.....	22
Hydrology	23
Fisheries.....	25
Scenery	27
Cultural Prehistory and Traditional Use	29
Wildlife	31
Vegetation and Ecology	34
Cultural History	36
Recreation.....	37
Public Involvement.....	42
Consultation with Native American Tribes	43
Issues.....	44
Chapter 2 -Alternatives, including the Proposed Action	55
Alternative 1- No Action.....	55
Alternative 2 -The Proposed Action.....	57
Alternatives Considered but not Analyzed in Detail	59
Comparison of Alternatives	60
Comparison of Alternative Effects	63
Chapter 3 - Environmental Consequences	67
River Boundary	67
Geology.....	69
Hydrology	74
Fish and their Habitat.....	91
Scenic Resources.....	97
Cultural Prehistory	103
Cultural Traditional Use	106
Wildlife	109
Ecology/Botany	117
Cultural History	124

Recreation.....	126
Other Disclosures	132
Consultation and Coordination	135
References	136
Appendix 1- Monitoring Plan	140

Tables

Table 1- Place Name Changes.....	8
Table 2. Riparian Reserve widths.....	15
Table 3. Alternative Comparison.....	60
Table 4. Alternative Effects Comparison.....	63
Table 5. Acres within the Proposed Boundary	68
Table 6. Acres that Change Management Allocation.....	68
Table 7. Geothermal Leases within the Wild and Scenic River.....	71
Table 8. Beneficial Uses Under the Clean Water Act.....	81
Table 9. Water Temperature Monitoring Data.....	82

Figures

Whychus Wild and Scenic River Project Area Locator Map.....	2
No Action Boundary- Alternative 1.....	54
Proposed Boundary – Alternative 2.....	56
Proposed Boundary- Management Allocation Changes.....	66

SUMMARY

The Deschutes National Forest proposes to develop a Comprehensive River Management Plan and boundary for Whychus Creek Wild and Scenic River. The plan would amend the Deschutes National Forest Land and Resource Management Plan (USFS 1990) Standards and Guidelines to provide specific management direction where needed to protect or enhance the river and its values or address issues related to river management.

The project area is located near Sisters, in Deschutes County and is within the Sisters Ranger District, Deschutes National Forest, Oregon.

This action is needed to fulfill the requirements of Section 3(d)(1) of the Wild and Scenic Rivers Act to prepare a Comprehensive River Management Plan to provide for the protection of the river and its values. The purpose of this Environmental Assessment is to provide a basis for comparing alternatives and selecting a management plan that protects the resource values of Whychus Creek. This document describes desired future conditions, existing conditions, environmental consequences, and management and monitoring needs. The Comprehensive River Management Plan will be completed after the public review and the final decision.

Two alternatives are analyzed: No action (Alternative 1) and one action alternative (Alternative 2). The Proposed Action is Alternative 2. All elements of the alternatives are entirely programmatic in nature. Future actions or projects would require appropriate National Environmental Policy Act (NEPA) documentation.

Alternative 1- No Action

Under the No Action alternative, current management plans would continue to guide management of the project area. The corridor boundary would be located approximately ¼ mile from the banks of the creek. No additional standards or guidelines would be implemented to accomplish the purpose of the Wild and Scenic River designation. The direction from the Deschutes National Forest Land and Resource Management Plan, as amended, including direction for Management Area 17 (Wild and Scenic Rivers) and other plans would remain unchanged.

Alternative 2- The Proposed Action

The action proposed by the Forest Service to meet the purpose and need would establish a new boundary and require a non-significant plan amendment to the Deschutes National Forest Land and Resource Management Plan to incorporate additional standards and guidelines and designate the final Wild and Scenic River boundary. The elements of this alternative would serve as the basis for development of a Comprehensive River Management Plan for the Whychus Creek Wild and Scenic River.

The goal of the proposed action is to protect and enhance the outstandingly remarkable values of Whychus Creek, restore degraded resources, and maintain the creek's wild and remote character. Restoration of degraded resources and management of recreational use would be accomplished through future site specific actions or projects. Long term protection of the outstandingly remarkable and significant values of the creek would be provided by additional management. Monitoring is a prominent part of the River

Management Plan in Alternative 2 using the Limits of Acceptable Change concept to focus on the desired future condition, rather than on how much use an area can tolerate.

Wild Segment

Management of the wild segment of the river corridor from its mountain headwaters on the glaciers of the Three Sisters to the Wilderness Boundary would be focused on protecting and preserving natural processes with minimal human influences. Recreation management would be designed to provide the most primitive experience, in as remote and natural a setting as possible. Developed access to the area is limited to trails in the Three Sisters Wilderness.

Scenic Segment

Management of the scenic segment of the river corridor from the Wilderness boundary to the hydrological Gauging Station 4 miles south of the City of Sisters would focus on maintaining and enhancing the near-natural environment. The riverbanks would be largely undeveloped and primitive, but would be accessible in places by roads or trails. Inaccessible areas which currently have little use and which provide high quality wildlife refugia would be retained.

The area would have a natural-appearing setting with limited improvements. There would be a gradient of management controls so areas closer to the City of Sisters would provide more facilities to manage use and higher reaches closer to the wilderness would provide fewer facilities. A few recreational facilities close to the City of Sisters may be developed to manage use to protect river values and provide interpretive and stewardship information. Recreational facilities such as trails or dispersed camping areas would be designed or managed to protect riparian areas, relocated, or removed. Access points such as trailheads, parking areas, information kiosks, or viewpoints would be strategically located in the corridor or adjacent to the corridor to manage recreation use.

New standards and guidelines would address protection of geological features, in stream wood, wildlife refugia and habitats, and cultural resources from recreational impacts. Additional standards guide vegetation management to protect deer habitat. Standards would define appropriate trails and locations.

All Segments

Opportunities would be provided for primitive and semi-primitive recreation experiences associated with enjoying the water, forests and mountain views while hiking, watching wildlife, camping, hunting, and fishing. Motorized use is allowed as specified by the Deschutes and Ochoco Travel Management Plan.

Primitive recreational experiences are non-motorized, in unmodified natural environments with very little evidence of human development, with rustic facilities for site protection but not user comfort, where few people are encountered.

Semi-primitive recreation experiences are generally within ½ mile from primitive roads, in a largely undisturbed natural environment with little evidence of human development, minimal facility development primarily for resource protection, where low to moderate numbers of people may be encountered (6-15 groups/day).

Additional clarification for wildfire suppression or management of fire for the benefit of natural resources would be provided.

Interpretation of the river values of Whychus Creek would be available in various forms to the public from low-key off-site interpretive materials to interpretive displays at appropriate locations.

Appropriate recreational or social events would be those which have no permanent effects on the creek's character, accomplish stewardship and restoration, provide education, and recreation opportunities or visitor experiences. They would be authorized through Special Use permits and authorizing NEPA.

Development of fixed improvements would be permitted on a case by case basis if they respond to a demonstrated need for public safety, fulfill a goal of this plan, fulfill an agency management role or involve research of values unique to Whychus Creek.

Recreation management would be designed for sustainability: 1) considering environmental, social, and economic factors that will influence the sustainability of the outstandingly remarkable and significant resource values, and 2) working with the community, visitors, and partners to provide the mental and physical benefits of outdoor recreation while protecting and enhancing the resource values for future generations.

The Forest Service would continue to work closely with state and local governments, partner organizations, and the public to encourage stewardship and develop community volunteerism.

Carrying Capacity and Use Limits

Recreational capacity would be established by defining desired future resource conditions and recreational experiences and by providing information and examples of consistent and inconsistent uses. The Recreational Opportunity Spectrum (ROS) characterization for each river segment helps define appropriate levels of development for settings and includes: access, remoteness, naturalness, facilities and site management, social encounters, and visitor management. Standards would define appropriate trail locations and allowable authorized uses to help maintain desired social settings over time. Monitoring would indicate the need for management actions necessary to maintain desired conditions (See Monitoring Plan- Appendix 1).

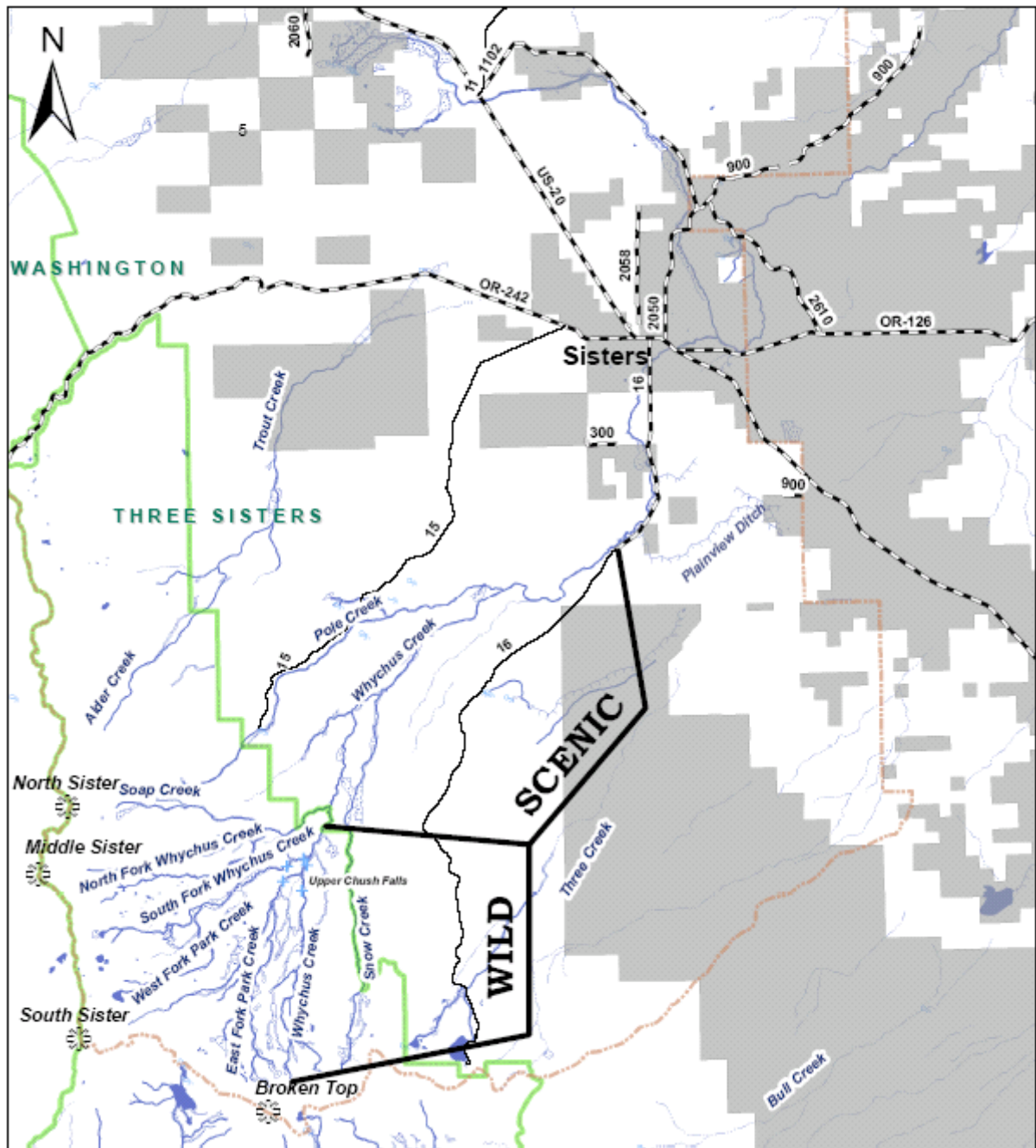
INTRODUCTION

Document Structure

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four parts:

- *Introduction:* The section includes information on the history of the project proposal, the purpose and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public about the proposal and how the public responded.
- *Comparison of Alternatives, including the Proposed Action:* This section provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- *Environmental Consequences:* This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area. Within each section, the existing condition is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.
- *Agencies and Persons Consulted:* This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- *Appendices:* The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Sisters Ranger District Office in Sisters, Oregon.



Whychus Creek Wild & Scenic River Sisters Ranger District Deschutes National Forest

- Wilderness Boundary
- Private
- Sisters RD Boundary

0 0.5 1 2 3 4 Miles

1:160,000



Background

In 1968, Congress passed the Wild and Scenic Rivers Act (P.L. 90-542) and established a nationwide system of outstanding free-flowing rivers. For a river segment to be considered eligible for Wild and Scenic River status it must be “free-flowing” and possess “outstandingly remarkable values” within its immediate environment. These rivers are protected for the benefit and enjoyment of present and future generations.

Whychus Creek (formerly Squaw Creek) is located in Central Oregon on the eastern slopes of the Cascade Mountains. It is a perennial stream that is a tributary of the Deschutes River. It is approximately 41 miles long from its headwaters in the Three Sisters Wilderness to its confluence with the Deschutes River. A portion of Whychus Creek was designated by Congress as a Wild and Scenic River as part of the Omnibus Oregon Wild and Scenic Rivers Act of 1988 (Public Law 100-557 - Oct.28, 1988) – an amendment to Section 3(a) of the Wild and Scenic Rivers Act (P.L. 90 - 542); USC 1274(a).

The designated area includes 15.4 miles, beginning at its source on the glaciers of the Three Sisters mountains and ending at the hydrological Gauging Station that is approximately 4 miles southwest of the City of Sisters in Central Oregon.

The designation reads as follows:

(102) **SQUAW CREEK, OREGON.** -- The 15.4-mile segment from its source to the hydrologic Gauging Station 800 feet upstream from the intake of the McAllister Ditch, including the Soap Fork Squaw Creek, the North Fork, the South Fork, the East and West Forks of Park Creek, and Park Creek Fork; to be administered by the Secretary of Agriculture as follows: (A) The 6.6-mile segment and its tributaries from the source to the Three Sisters Wilderness boundary as a wild river; and (B) the 8.8-mile segment from the boundary of the Three Sisters Wilderness Area to the hydrologic Gauging Station 800 feet upstream from the intake of the McAllister Ditch as a scenic river: *Provided*, That nothing in this Act shall prohibit the construction of facilities necessary for emergency protection for the town of Sisters relative to a rapid discharge of Carver Lake if no other reasonable flood warning or control alternative exists.

Wild Section

The 6.6 mile segment of the creek from its source on the Three Sisters mountains to the Three Sisters Wilderness boundary is classified as “Wild”. The source of Whychus Creek begins on the glaciers of the Three Sisters mountains and includes Soap Creek, the South and North Forks of Whychus Creek, and Park Creek, including the East and West Forks of Park Creek. Wild rivers are defined in the Wild and Scenic Rivers Act as: *“Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.”*

Scenic Section

The 8.8 mile segment from the Three Sisters Wilderness boundary to the USGS hydrological gauging station is classified as “Scenic.” Scenic Rivers are defined in the Wild and Scenic Rivers Act as: *“Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.”*



Carver Lake September 2008 - by Tay Robertson

Carver Lake

Special consideration of Carver Lake, a high-elevation moraine lake on South Sister, is included in the designation. In the mid-1980's Carver Lake was identified as a potential flood risk for Sisters and homes along Whychus Creek by the U.S. Geological Survey. Risk reports have since been downgraded, but still exist.

The Wild and Scenic River designation states: *“Nothing in this Act shall prohibit the construction of facilities necessary for emergency protection for the town of Sisters relative to a rapid discharge of Carver Lake if no reasonable flood warning or control alternative exists.”*



Whychus Creek and Rock Penstemon

Resource Assessment

The values for which Whychus Creek was designated were not identified through a pre-designation study. A Resource Assessment was an important first step in the preparation of a Comprehensive River Management Plan for Whychus Creek to provide for protection of its values.

An interdisciplinary team was convened in March 2003 to complete this process. The assessment took into consideration all features which are directly river-related and provided a comprehensive approach to investigating the relationship of river features. Members of the team included specialists in the following areas: hydrology, geology, fisheries, scenery management, wildlife biology, archeology, recreation management and ecology.

There are three components to the resource assessment process: 1) the identification of outstandingly remarkable values, 2) the identification and determination of significance levels for river-related values which contribute to its overall character, and 3) the confirmation of outstandingly remarkable values set forth for the river in the legislative history of its designation. Public outreach was included and is discussed below. Extensive work was accomplished before several years of large wildfires interrupted the assessment process. The assessment was reinitiated and the final draft was completed in 2007 (USFS 2007).

Outstandingly Remarkable Values

The term “outstandingly remarkable values” has never been precisely defined. The assessment of which values are outstandingly remarkable for Whychus Creek was based on the professional judgment of the interdisciplinary team and documented objective, scientific analysis based on reviews of available literature, consultation with experts, and field work. The region of comparison for Whychus Creek was generally the Central Oregon area.

To be considered “river-related” values should:

1. Be located in the river or its immediate environment (generally within ¼ mile on either side),
2. Contribute substantially to the functioning of the river ecosystem, and/or
3. Owe its existence to the presence of the river.

River-related value must be rated for level of significance. Levels include:

- *Outstandingly Remarkable* – A unique, rare, or exemplary feature that is significant at a comparative regional or national scale.
- *Significant (but not outstandingly remarkable)* - Values which still contribute substantially to the rivers character. These values may still need varying levels of protection and consideration in the development of a Wild and Scenic River Plan.
- *Insufficient information* - If the level of existing data is insufficient to make a determination of significance, then it must be identified. The values need to be protected as “outstandingly remarkable” until more information is gathered.

The following Outstandingly Remarkable Values and Significant Values were identified for Whychus Creek Wild and Scenic River:

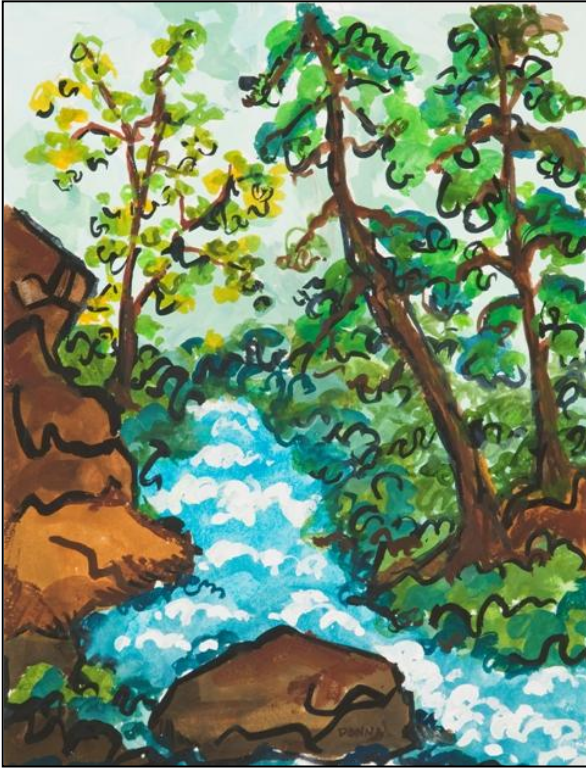
Outstandingly Remarkable Values:

****Geology**
****Hydrology**
****Fish**
****Scenic Resources**
****Cultural- Prehistory**
****Cultural- Traditional Use**

Significant Values:

***Wildlife**
***Ecology/Botany**
***Cultural- History**
***Recreation**

Name Changes



"Righteous on the Whychus"
by Donna Simpson

Historic names for the creek include:

- *Whychus
- *Sesequa
- *Benton Creek
- *Clark's River
- *Squaw Creek

The story of how the creek was called "Squaw Creek" is one indication of its traditional use by Native American Tribes.

It is recorded in the unpublished memoirs of a Sister's homesteader named Newt Cobb, that one day two men came upon a camp of Native American women and their dogs next to the creek. Their horses were scared by the dogs and ran off and had to be chased. Cobb recorded "After that it was generally called Squaw Creek".

After hearing this story, elders of the Confederated Tribes of Warm Springs said that people would often camp for 2 to 3 days in one place and the men would go out hunting while leaving the women in camp.

In 2001, Oregon became the sixth state to ban the term "Squaw" from public place names under Senate Bill 488. This was because many Native Americans consider the word "Squaw" to be a derogatory term. Deschutes and Ochoco National Forest officials proposed name changes to comply with the state law and federal directives. Forest Service regulations prohibit derogatory names from being used in documents or on maps.

On December 8, 2005 the U.S. Board on Geographic Names gave final approval to sixteen name changes and one new name for Central Oregon landscape features that use the word "Squaw". The changes removed the derogatory word as a place name which resulted from several years of consultation with the Confederated Tribes of Warm Springs and the Oregon Geographic Names Board. The U.S. Board on Geographic Names made final judgment on the proposed name changes after the Oregon Geographic Names Board's approval of the proposal in October 2005. The state board supervises the naming of all geographic features within Oregon, however final approval is required by the U.S. Board on Geographic Names before the changes are final.

The name “Whychus” was chosen for the creek because it had the strongest historical and legal usage of any alternate name. It was recorded on government maps (1863- Surveyor Generals Office map). It had been used in government documents and was mentioned in the geographical reference book, *Oregon Geographic Names* (McArthur 2003) as the historic name for Squaw Creek.

Five names within the designated Wild and Scenic River area were included in the name changes and are displayed in the Table below.

Table 1- Place Name Changes in the Whychus Creek Wild and Scenic River Area

Old Name	New Name	Meaning
1) Squaw Creek	Whychus Creek <i>Pronounced “Why choose”</i>	<i>Historic-</i> Earliest recorded name from 1855 Pacific Railroad Reports. Derived from Sahaptin language. Meaning: “The place we cross the water”
2) North Fork of Squaw Creek	North Fork of Whychus Creek	<i>Historic-</i> see above
3) South Fork of Squaw Creek	South Fork of Whychus Creek	<i>Historic-</i> see above
4) Lower unnamed waterfall, commonly called Squaw Creek Falls	Chush Falls	<i>Native American-Sahaptin</i> word for water
5) Squaw Creek Falls	Upper Chush Falls	<i>Native American-Sahaptin</i> word for water

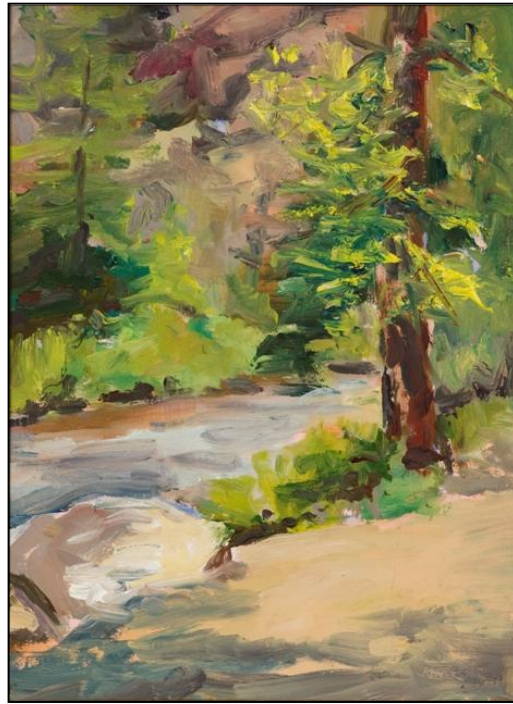
Changing these names in the Wild and Scenic Rivers Act requires congressional action. Legislation is pending to make the change to reflect the new names. Because these landscape feature names have been legally changed, this document will use them, except when quoting from the legislative record.

Management Direction

The Interdisciplinary Team reviewed the many documents which currently provide management direction for Whychus Creek Wild and Scenic River to determine whether changes or more direction were needed to protect river values or address specific management issues.

All federal land management activities in the Whychus Wild and Scenic River Plan Project area must follow standards and guidelines listed in the following plans and be guided by analyses such as Watershed Analysis and Late Successional Reserve Assessments.

The Desired Future Condition for the project area is derived by the management goals in these documents, and analysis incorporated by reference and is discussed in more detail below.



"Above Whychus Creek" by Kay Baker

Deschutes National Forest Land and Resource Management Plan

The project area encompasses lands managed under the Deschutes National Forest Land and Resource Management Plan (USDA 1990) as amended. This plan was analyzed in the Final Environmental Impact Statement for Deschutes National Forest Land and Resource Management Plan (USDA 1990). The plan establishes goals, objectives, and standards and guidelines for management areas on the Forest, as well as Forest-wide standards and guidelines. Two Management Areas apply to the river area:

Wilderness (MA- 6): The portion of Whychus Wild and Scenic River designated as "Wild" is within the Three Sisters Wilderness. The goal for this management area is to feature naturalness, opportunities for solitude, challenge, and inspiration, and within these objectives to provide for recreational, scenic, scientific, educational, conservation, and historical uses. Permitted but nonconforming uses specified in the Wilderness Act of 1964, are carried out under restrictions designed to minimize their impact to the Wilderness. The decisive criteria in all conflicts preserves and protects the Wilderness character of the resource. Specific standards and guidelines define social settings, permitted uses, capacity, and management of vegetation, recreation, natural and cultural resources, and other needs.

Natural processes are emphasized including the natural role of fire, insects and disease, the role of native species, and preferred methods for revegetation of impacted areas.

Visitor management limits group sizes, encourages “no trace” camping, does not permit contests, races, promotions or fundraisers. Commercial uses such as summer outfitter guides are assessed to be at adequate and maximum levels although winter outfitter guides may have some potential for expansion. Allowable use of regulations and site restoration actions are outlined and allowable trail construction for safety or to prevent resource damage is defined. Mineral pits and geothermal leasing are not permitted.

Wild and Scenic Rivers (MA- 17): Both the “Wild” and “Scenic” sections of Whychus Creek are included in this management area although the “Wild” section is within the Three Sisters Wilderness and Wilderness standards also apply (see above). The goal for this management area is to protect and enhance those outstandingly remarkable values that qualified segments of Whychus (and other rivers) for inclusion in the National Wild and Scenic Rivers System. This direction was meant to serve as interim management direction until a formal river corridor plan is completed with a Forest Plan amendment.

Specific standards and guidelines are described related to vegetation management, water supply, hydroelectric power, flood control, mining, geothermal, roads, recreation development, scenic quality, structures, utilities, commercial uses, and motorized travel. Standards for the “Wild” River are generally identical to Wilderness. Standards for the “Scenic” section emphasize the natural appearance of vegetation and protection of riparian plant communities, and consideration of the river’s outstandingly remarkable values in determining whether uses such as geothermal leasing, recreational developments, structures, utilities or motorized travel are allowed.

Forest Wide Standards and Guidelines: Many other Forest-wide standards and guidelines apply to the river area including specific guidelines for recreation, forest health, wildlife, riparian areas, fisheries, minerals, best management practices for water and soils, fire and fuels management, special uses, and geothermal.

Cultural Resource Management Direction: Management direction for cultural resources is found in the Deschutes National Forest Resource Management Plan, in the Forest Service Manual Section 2360, in federal regulations 36CFR64 and 36CFR800, and in various federal laws including the National Historic Preservation Act of 1966 (as amended), the National Environmental Policy Act, and the National Forest Management Act. In general, the existing management direction asks the Forest to consider the effects on cultural resources when considering projects that fall within the Forest’s jurisdiction. Further direction indicates that the Forest would determine what cultural resources are present on the Forest, evaluate each resource for eligibility to the National Register of Historic Places (Register) and protect or mitigate effects to resources that are eligible.

The Northwest Forest Plan

The upper 4.6 miles of the Scenic river section and the entire Wild River section are managed under direction commonly called the “Northwest Forest Plan” or more accurately the “Record of Decision for Management of Habitat for Late-Successional and Old Growth Forest Related Species within the Range of the Northern Spotted Owl”(USFS and BLM 1994).

The plan is a series of federal policies and guidelines governing land use on federal lands in the Pacific Northwest region of the United States. The plan was developed with the intent of protecting habitat for the northern spotted owl, but came to include much broader habitat protection goals. It creates a network of Riparian Reserves and Late Successional Reserves to conserve and protect habitat and amends the the Deschutes National Forest Land and Resource Management Plan (USDA 1990).

The Scenic River section outside the Wilderness (1,589 acres) is managed under the Northwest Forest Plan as a Late Successional Reserve. These lands are meant to maintain old growth forest ecosystems and serve as habitat for species which need older forests. Riparian Reserves are areas along all permanent and intermittent waterbodies and wetlands where the main purpose is to protect the health of the aquatic ecosystem and its dependent species. The Wild River section is managed as Congressionally Withdrawn.

Aquatic Conservation Strategy

The Northwest Forest Plan relies on an Aquatic Conservation Strategy which was implemented to protect and improve the health of the region’s aquatic ecosystems. Riparian Reserves are one component of the strategy. Key watersheds are another component of the strategy and are divided into two tiers. Tier 1 key watersheds are those that contribute directly to the conservation of anadromous salmonids, bull trout, and other resident fish species. Tier 2 Key Watersheds are sources of high quality water, though they may not contain at-risk fish species. Whychus Creek (O-442) was identified as a Tier 2 Key Watershed.

Watershed Analysis, a systematic procedure to characterize the aquatic, riparian and terrestrial features within a watershed, is required in all key watersheds to prescribe management activities and develop monitoring programs. An initial Watershed Analysis for the Whychus watershed was completed (USFS 1998) and The Sisters/Whychus Watershed Analysis refined Riparian Reserve widths under the Northwest Forest Plan based on average maximum tree height, 100 year floodplain, extent of riparian vegetation, and unstable and potentially unstable lands (See Table 2 in this Chapter).

Northwest Forest Plan Standards and Guidelines

Northwest Forest Plan Standards and Guidelines provide substantial protection to Late Successional Reserves and Riparian Reserves.

Standards require silvicultural activities, including prescribed burning in Late Successional Reserves, be focused on reducing risk in younger stands with the objective of accelerating development of late successional conditions. The detailed triggers for

management in Whychus Wild and Scenic River Late-Successional Reserves are guided by and discussed below under the Whychus Late-Successional Reserve Assessment (USFS 2001).

Standards prohibit timber harvest, including firewood cutting in Riparian Reserves, however they allow the application of silvicultural practices to acquire desired vegetation characteristics where needed to attain Aquatic Conservation Strategy Objectives or to mitigate damaging effects from catastrophic events such as fire, flooding, volcanic, wind, or insect damage. Any proposed salvage of trees would have to meet this standard. Practices must be applied in a manner that does not retard attainment of Aquatic Conservation Strategy Objectives. Hazard trees in Riparian Reserves may be felled but can only be removed if they are not needed to meet woody debris objectives.

Northwest Forest Plan standards for developments state that developments including recreational sites, powerlines, etc., that may adversely affect Late Successional Reserves should not be permitted. Where these projects address public needs or provide significant public benefits they are reviewed on a case by case basis and may be approved if adverse effects can be minimized and mitigated. Management of dispersed recreation use can be adjusted if activities are affecting Late Successional Reserve objectives.

Recreation facilities including trails and dispersed sites should be operated and designed in a manner that does not retard or prevent attainment of the Aquatic Conservation Strategy Objectives. Existing recreational facilities must be relocated or closed if they cause adverse effects. Dispersed recreation practices that have adverse effects must be adjusted by such measures as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, specific site closures, or eliminating the practice or occupancy.

Regional Forester Amendment #2-Revised Continuation of Interim Management Direction Establishing Riparian, Ecosystem, and Wildlife Standards for Timber Sales (Eastside Screens)



Old growth Ponderosa Pine along Whychus Creek

The lower 4.2 miles of the “Scenic” river corridor are managed under direction commonly called the “Eastside Screens.” In August 1993, the Regional Forester issued a letter providing direction to National Forests on the eastside of the Cascade Mountains on retaining old-growth attributes at the local scale and moving toward the historic range of variability (the range of forest conditions likely to have occurred before European settlement) across the landscape. This direction was called “Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales, Regional Forester’s Forest Plan Amendment”, and became known as the “Eastside Screens”.

The Eastside Screens limit certain types of activities in watersheds where old growth forests are now less common than the historic range of variability and are intended to maintain management options for the future. The screens also provided

direction on buffers and other protections for streams and wetlands. The Whychus Watershed Analysis found that old growth forests in the area are limited and highly altered from past logging and fire suppression (USFS 1998, 2009).

A decision notice issued in May 1994 amended all eastside Forest Plans to include this direction. The May 1994 decision notice was revised in 1995 and was called “Revised: Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales, Regional Forester’s Forest Plan Amendment #2”, and has continued to be known as the “Eastside Screens”. Since the 1995 revision, there have been several letters of clarification from the Regional Office regarding the Eastside Screens. In 1995 Inland Native Fish Strategy standards replaced direction on riparian area management in the Eastside Screens (see below).

Inland Native Fish Strategy - INFISH (1995)

The lower 4.2 miles of the “Scenic” river corridor are also managed under direction from the Inland Native Fish Strategy or INFISH (USFS 1995).

The Deschutes National Forest Management Plan was amended in 1995 by the Decision Notice and Finding of No Significant Impact for the Inland Native Fish Strategy (INFISH). INFISH provides interim direction to protect habitat and populations of resident native fish. These standards replace the direction on riparian area management in the Eastside Screens.

Priority watersheds were identified to help prioritize restoration, monitoring and watershed analysis for areas managed by INFISH. The Whychus Wild and Scenic River Plan project is within the Headwaters of Whychus Creek subwatershed and the Upper Whychus Creek subwatershed. Neither are considered “priority watersheds” under INFISH.

Another essential piece of INFISH is the delineation of Riparian Habitat Conservation Areas (RHCAs). These are portions of the watershed where riparian dependent resources receive primary emphasis and management activities in these areas are subject to specific standards and guidelines. Riparian Habitat Conservation Areas include traditional riparian corridors, wetlands, intermittent headwater streams, and other areas where proper ecological functioning is crucial to help maintain the integrity of the aquatic ecosystems by: 1) influencing the delivery of coarse sediment, organic matter, and woody debris to streams, 2) providing root strength for channel stability, 3) shading the stream, and 4) protecting water quality” (USFS 1995).

The Sisters/Whychus Watershed Analysis (USFS 1998) refined Riparian Reserve widths under the Northwest Forest Plan based on average maximum tree height, 100 year floodplain, extent of riparian vegetation, and unstable and potentially unstable lands. These same adjustments to Riparian Reserves in the Northwest Forest Plan area are applied to Riparian Habitat Conservation Areas for subwatersheds in the Sisters/Whychus analysis area that follow under the guidance of INFISH (See Table 2 below).

INFISH Standards and Guidelines

INFISH Standards and Guidelines provide substantial protection to Riparian Habitat Conservation Areas and hydrologically connected uplands.

Standards prohibit timber harvest, including firewood cutting in Riparian Habitat Conservation Areas, however they allow the application of silvicultural practices in Riparian Habitat Conservation Areas to acquire desired vegetation characteristics where needed to attain Riparian Habitat Management Objectives or to mitigate damaging effects from catastrophic events such as fire, flooding, volcanic, wind, or insect damage. Any proposed salvage of trees would have to meet this standard. Practices must be applied in a manner that does not retard attainment of Riparian Habitat Management Objectives and that avoids adverse effects on inland native fish (TM-1).

Hazard trees in Riparian Habitat Conservation Areas may be felled but must be kept on site when needed to meet woody debris objectives.

INFISH standards also require fuel treatment strategies, practices, and actions including prescribed burning be designed so as to not prevent the attainment of Riparian Habitat Management Objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management actions are needed (FM-1 and FM-4).

INFISH standards for recreation management require that recreational facilities including trails and dispersed sites be operated and designed in a manner that does not retard or prevent attainment of the Riparian Management Objectives and avoids adverse impacts on inland native fish. Existing recreational facilities must be relocated or closed if they cause adverse effects. Dispersed recreation practices that have adverse effects must be adjusted by such measures as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, specific site closures, or eliminating the practice or occupancy.

Riparian Reserve and Riparian Habitat Conservation Area Widths For Whychus Wild and Scenic River

The following Riparian Habitat Conservation Area widths (INFISH) and Riparian Reserve widths (Northwest Forest Plan) apply to the length of Whychus Wild and Scenic River. Widths were verified by the Whychus Watershed Analysis (2009).

Table 2. Riparian Reserve (RR) and Riparian Habitat Conservation Area (RHCA) widths in the Whychus Wild and Scenic River Plan Project area.

<i>Category</i>	<i>Stream Class</i>	<i>Description</i>	<i>RR width (slope distance (ft) from edge of channel)</i>	<i>RHCA width (slope distance (ft) from edge of channel)</i>
1	1 & 2	Fish-bearing streams	300 ft	300 ft
2	3	Permanently flowing non-fish-bearing streams	150 ft	150 ft
3	NA	Ponds, lakes, reservoirs, and wetlands > 1 ac	150 ft	150 ft
4	4	Seasonally flowing or intermittent streams, wetlands < 1 ac, unstable or potentially unstable areas	150 ft	70 ft

Clean Water Act (1977, as amended in 1982)

The State of Oregon, as directed by the Clean Water Act and the Environmental Protection Agency, is responsible for the protection of rivers and other bodies of water in the public interest.

Whychus Creek, throughout its length, is listed on the Oregon 2004/2006 303(d) list for water quality exceeding the State standard established in 2004. This is because lower portions of Whychus Creek outside the Wild and Scenic River Corridor have exceeded the 7-day average maximum water temperature standard for salmon and trout rearing and migration which is 18° C (ODEQ 2007). Although stream temperatures in the Wild and Scenic River area are not above the State standard, Whychus Creek is still listed as impaired its entire length because the listing criteria is based on beneficial uses.

Beneficial uses as defined by the State of Oregon for the Whychus Creek watershed are listed in the Hydrology analysis. To show that water quality is being protected, states are required by the Clean Water Act to adopt water quality standards which must be approved by the Environmental Protection Agency. Best Management Practices (BMP) and state-wide management plans are a requirement of the Clean Water Act and are used to meet water quality standards.

Waterbodies within the Whychus Wild and Scenic River Plan Project area that do not meet the State Standards for water quality are discussed in this report within the Water Quality – 303(d) Listed Stream section. The project was designed to meet the requirements of the Clean Water Act.

Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program (USDA, 2005)

This environmental assessment is tiered to a broader scale analysis, the Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program. The associated Record of Decision amended the Deschutes National Forest Plan by adding management direction relative to prevention and treatment of invasive plants (formerly called noxious weeds).

Inventoried Roadless Areas and Roads Analysis

There are no Inventoried Roadless Areas within the project area.

There are no proposed closures of existing system roads and no planned construction of new permanent roads associated with this project. Reducing road densities in the area is recommended by the Deschutes Forest Plan (1990) and in the Whychus Watershed Analysis (USFS 2009) because of the Standards and Guidelines for Key Watersheds in the Northwest Forest Plan discussed above. Any road closures or conversion of roads to trails would be analyzed by a site specific environmental analysis. Based on the action alternatives and in consultation with the Forest Road Manager and District Ranger it was determined that a Roads Analysis was not required for this project.



"Whychus Waterfall" by Paul Alan Bennett

Analysis Incorporated by Reference

Whychus Watershed Analysis (1998, 2009)

The Whychus Watershed is one of seven Key Watersheds identified on the Deschutes National Forest. Key watersheds are identified as crucial to at-risk fish species and provide high water quality. A Watershed Analysis was completed to develop a landscape level assessment to guide project planning (USFS 1998). The assessment process examined current and historic conditions and identified trends of concern in the watershed, and provided recommendations as a basis for future management. The Whychus Watershed Analysis Update (USFS 2009) includes additional information captured below.

Relevant trends are discussed in more detail under the Existing Condition sections of this document. The following conditions that may support a need for management action were identified for the project area in the watershed:

- Changes in forest structure and composition due to past logging and the exclusion of fire.
- Decline of old growth forests and large trees due to past logging and the exclusion of fire.
- Need for fuels reduction, including preparation for wildfires in high elevation and lodgepole pine forests with extensive mountain pine beetle caused mortality.

- Degradation of riparian habitats by lack of natural disturbances (fire, beaver, floods), past logging, damaging recreational use.
- Meadow encroachment by small trees due to lack of fire
- An increase in large rain-on-snow flood events on Whychus Creek in the last 10 years creating increased flooding risks.
- Continued need for restoration of water flows on Whychus Creek.
- Population increases in Sisters and Central Oregon, and faster than average growth rates.
- Lack of funding for trail maintenance.
- More user roads and trails, including illegally built trails of all types.
- Increasing mountain bike and horse use.
- Increasing Off Highway Vehicle use with more user trails and damage to resources.

Management recommendations for these trends are described and prioritized in the assessment. See Whychus Watershed Analysis (USFS 1998, 2009).

Whychus Late Successional Reserve Assessment (2001)

Late Successional forest ecosystems along Whychus Creek support a unique array of wildlife and plant species. Managers are required to prepare an assessment of existing conditions and appropriate activities for Late-Successional Reserves and dependent species. This was completed for Whychus Creek Late-Successional Reserve in 2001. A specific Management Strategy Area was identified surrounding the Wild and Scenic River, called the Whychus Creek Management Strategy Area.

The assessment identified primary risks or limiting factors preventing attainment of Late Successional goals and objectives in the Whychus Creek Management Strategy Area and described specific management priorities, options, locations, and triggers for action.

The following trends in need of management action were identified for the Whychus Creek Management Strategy Area:

- Risk of loss of forests from catastrophic fire.
- Risk of loss of forests from epidemic levels of mistletoe, and other insects and diseases.
- Limited large tree structure.
- Inadequate habitat for Northern Spotted Owls and other interior forest species.
- Fragmented dispersal habitat for the Northern Spotted Owl.
- Changes in species composition from historic types.
- Limited snags and down wood.
- Detrimental impacts in riparian areas from human use.
- Changes in density and composition of riparian vegetation, including lack of large trees, high densities of small trees and loss of aspen and cottonwood.
- Meadow encroachment.
- Detrimental impacts from high road densities and use of vehicles off –roads.
- Noxious weeds (now termed Invasive Plants)

Management options for these trends are outlined by area, allowable amounts, timing, and what would trigger the action in the assessment. See Whychus Late Successional Reserve Assessment (USFS 2001).

Greater Sisters Country Community Wildfire Protection Plan (2009)

The Greater Sisters Country Community Wildfire Protection Plan ([http://www.deschutes.org/go/living-here- Quick Links](http://www.deschutes.org/go/living-here-Quick Links)) provides a framework to protect human life and reduce property loss due to uncharacteristic wildfire in the communities and surrounding areas of Sisters/Camp Sherman, Black Butte Ranch, and Cloverdale Rural Protection Districts.

Portions of the Scenic River corridor are considered within the Wildland Urban Interface because they are within the ½ mile buffer on each side of a major transportation and evacuation route, US Forest Service Road 16 (Three Creeks Road) as identified in the Greater Sisters Country Community Wildfire Protection Plan.

Purpose and Need for Action_____

The purpose of this assessment is to provide the basis to develop a Comprehensive River Management Plan and boundary for Whychus Creek Wild and Scenic River. The plan would amend Deschutes National Forest Land and Resource Management Plan goals, objectives, and Standards and Guidelines to provide specific management direction where needed to protect or enhance river values or address issues related to river management. The Whychus Creek Wild and Scenic River Plan would establish a final river corridor boundary and describe desired future conditions, existing conditions, standards and guidelines, and direct future management and monitoring.

This action is needed to fulfill the requirements of Section 3(d)(1) of the Wild and Scenic Rivers Act that states that “the Federal agency charged with the administration of each component of the National Wild and Scenic Rivers System shall prepare a comprehensive management plan...to provide for the protection of river values. The plan shall address resource protection, development of lands and facilities, user capacities, and other management practices necessary or desirable to achieve the purposes of this Act. The plan shall be prepared, after consultation with State and local governments and the interested public within three full fiscal years after the designation.”

The proposed Forest Plan Amendment provides an opportunity to achieve the overall goals and objectives of the Deschutes National Forest Land and Resource Management Plan without significantly altering them.

Two alternatives are analyzed in detail: No action (Alternative 1) and one action alternative (Alternative 2). The Proposed Action is Alternative 2.



A Vision for Whychus Creek Wild and Scenic River

Whychus Creek will keep its secrets and remain a river with a wild feeling. In the secluded high reaches of melting glaciers on the mountain slopes the water's conversation with the land will remain a whisper that few hear.

As the rivulets gather and form a creek rushing out of the wilderness the voice of snowmelt rushing over stream cobble will tell a story to those who stop to hear it. Volcanoes and glaciers, waterfalls, steelhead, endless forests, wildlife, wildflowers, and ancient tribal journeys are this story's chapters.

As the creek approaches the mountain town that shaped its past and is restoring its future, the story will be easier to hear and the creek easier to find. The story's happy ending is full of redemption as the length of the Whychus Watershed comes back to life and reclaims its role between the mountains and sea-going fish and the community rediscovers a river they had forgotten.



"Whychus Creek" by Jerry Dame

Desired Future Condition, Existing Condition, and Need

The goal of the Whychus Creek Wild and Scenic River Management Plan is to protect and enhance the outstandingly remarkable resource values for which Whychus Creek was designated into the Wild and Scenic Rivers System. These outstandingly remarkable river values were determined by the Resource Assessment (USFS 2007) as: Geology, Hydrology, Fish, Scenic Resources, Cultural- Prehistory, and Cultural- Traditional Use. Significant river- related values include: Wildlife, Vegetation/Ecology, Cultural History and Recreation and are also addressed. The plan focuses on maintaining the creek's current character with an emphasis on identifying and rehabilitating degraded resources.

The following discussion defines the desired future condition in broad terms, presenting a vision of the desired state of particular resources in the river corridor, existing conditions, and management needs. New Standards and Guidelines would be adopted to provide additional management direction where needed. This discussion serves as a basis for determining how to interpret more specific standards and guidelines when conflicts arise or when clarity is needed. Examples of consistent and inconsistent uses are given. Actions that lead toward the desired conditions over the long term are consistent with this plan. Actions that lead the corridor away from desired conditions or Limits of Acceptable Change over the long term are not consistent with this plan. A Monitoring Plan to detect Limits of Acceptable Change is found in Appendix 1.

Geology (Outstandingly Remarkable Value)

Desired Future Condition

Landscapes within and near the channel of Whychus Creek possess a concentration of complex, diverse, and highly scenic geologic features created by glacial and volcanic events. Steep and narrow canyons, deep bedrock canyons, numerous waterfalls, a variety of channel shapes, broad alluvial valleys, channel-filling giant boulders, water carved caves, and channel beds of polished rock with potholes, broad channels, beds of platy



Polished rock channel bed with potholes

andesites, and rock spires will inspire those that find them. The diverse and varied geological features of Whychus Creek are protected and provide opportunities for learning about the unique volcanic and glacial forces which formed this mountain landscape.

Consistent Uses: The following activities are examples of uses that are consistent with protection of the Geology Outstandingly Remarkable Resource Value:

- Low impact rock climbing and recreation that does not damage geological features.
- Installation of scientific monitoring equipment with negligible impacts.

Conflicting Uses: The Geology Outstandingly Remarkable Resource Value could be adversely affected by:

- Future mining claims or mineral material sources.
- Rock climbing; if the rock is chiseled, drilled, or hammered.
- Climbing chalk; which leaves visible “trails” on the rock.

Existing Condition and Management Needs

Activities such as mining and geothermal development are addressed in existing direction. However, rock climbing has increased in the corridor and it could affect geologic features by techniques which chisel or drill rock or install permanent climbing hardware. White chalk trails can affect both integrity and appearance of rocks, rock walls, and spires.

Need: Guidelines for “Leave No Trace” Rock climbing.

Hydrology (Outstandingly Remarkable Value)

Desired Future Condition

The cold waters of Whychus Creek originating on glaciers of the Three Sisters Mountains are the cornerstone of the area's ecology, providing habitat for thriving populations of plants, animals, and fish.

Water quality throughout the corridor is managed for the highest quality possible. Degradation, such as a reduction

in shade or increase in sedimentation from riparian

trails, roads, or campsites, is addressed through management actions. Natural fluctuations in flow from snow melt and rain-on-snow are expected. Complex channel morphology created by glacial erosion through diverse geological features maintains a variety of water-carved features and waterfalls. Instream wood, which is important for channel stability and function, is recruited and maintained. Wetlands within the Wild and Scenic River boundary are maintained and restored for both their unique habitat and contribution to the river's late-season stream flows.

Pristine high elevation moraine-dam lakes such as Carver Lake are remnants of the Little Ice Age and are part of the headwaters of the creek, providing late-season cool water flows. The Forest Service, scientists, and the community will continue to work together to better understand the threat posed by a future glacial moraine dam failure at Carver Lake and work to find solutions which best protect the community, the values associated with the Three Sisters Wilderness, and the Whychus Wild and Scenic River.

Consistent Uses: The following activities are examples of uses that are consistent with protection of the Hydrology Outstandingly Remarkable Resource Value:

- Relocating the Hydrological Gauging Station (#14075000).
- The Congressional Wild and Scenic River designation states: *"Nothing in this Act shall prohibit the construction of facilities necessary for emergency protection for the town of Sisters relative to a rapid discharge of Carver Lake if no reasonable flood warning or control alternative exists."*
- Continued use of signs to warn visitors that the Carver Lake flood hazard exists.
- Consolidation or removal of trails, roads, and campsites in the riparian area.
- Vegetation management which meets all other direction and protects stream shade, streambanks, and provides for long term wood input.
- Low impact recreation which protects Outstandingly Remarkable Values.
- Installation of scientific monitoring equipment with negligible impacts.



Chush Falls

Conflicting Uses: The Hydrology Outstandingly Remarkable Resource Value could be adversely affected by:

- Activities which alter channel morphology.
 - Removing or cutting instream wood.
 - Driving vehicles through the channel.
 - Bridge or culvert installations which destabilize streambanks.
 - Adding riprap along streambanks.
- Vegetation management which removes future instream wood, causes erosion or removes streamside shade.
- Wildfire suppression techniques which may cause more damage to the creek's water quality and riparian areas than direct and indirect wildfire effects (i.e. poorly located safety zones, fire camps that could adversely impact the corridor, drop points in riparian areas, dozer lines or fire lines in riparian areas or hydrologically connected areas that lead to excessive erosion.
- Activities which could pollute the river.
 - Fire retardant or a retardant mixing plant that could contaminate the creek.
 - Herbicides or other chemicals which are not safe for aquatic use.

Existing Condition and Management Needs

Standards and guidelines from existing plans adequately protect the area's hydrology with protection from the Aquatic Conservation Strategy and Riparian Management Objectives. Congressional direction regarding the Carver Lake hazard is clear.

Instream wood is integral for channel function and stability in Whychus Creek. Currently, creek boating occurs on the creek and its popularity may increase. Creek boating is a subset of whitewater kayaking where paddlers seek narrow streams, fast currents and waterfall drops. See discussion under Fish habitat.

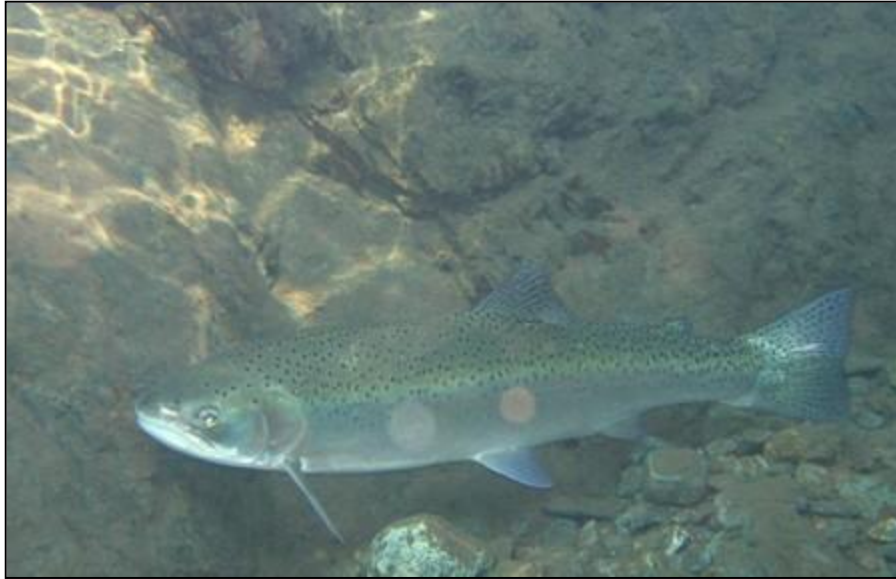
Need: *Guidelines to prevent wood manipulation for boating.*

Although the existing guidance under the Aquatic Conservation Strategy and the Riparian Management Objectives protect the hydrology resource, interpretation and clarity on how to protect the resource is minimal. Due to the undeveloped nature of the Whychus Wild and Scenic corridor, users are creating their own roads, trails, and campsites. Some of these areas are eroding streambanks, trampling fragile riparian vegetation, and/or causing sedimentation.

Need: *Guidelines to consolidate riparian trails and to relocate trails to more stable areas that do not cause erosion.*

Guidelines to emphasize need for reducing impacts to vegetation and water quality from dispersed camping.

Guidelines to emphasize need for reducing riparian roads in the Wild and Scenic River corridor by closure, decommissioning, and rehabilitating closed roads to restore vegetation and infiltration.



Wild Steelhead

Fisheries (Outstandingly Remarkable Value)

Desired Future Condition

Wild steelhead and redband trout migrate freely along Whychus Creek, resuming their journeys after an interruption of over 40 years. The creek provides high quality fish habitat for native redband trout, and regains its stature as a key area for anadromous steelhead survival. The genetic integrity of the native strain of Interior Columbia Basin redband trout remains intact.

Natural processes keep the river well supplied with wood for pool formation, overhead cover and organic matter for invertebrate production. Riparian vegetation of the floodplain provide streambank stability and shade. Natural inputs of groundwater from springs and tributaries are allowed to contribute to the high water quality and cool water temperatures. The naturally high level of fine sand supplied by the glacial headwaters is moderated by floodplains in the middle reaches that allow fine sediments to be deposited off-channel during floods. Middle elevations of the watershed do not significantly contribute additional loads of fine sediment to the streambed. Active floodplains in the middle reaches of Whychus Creek provide diverse off-channel habitats for rearing steelhead trout, redband trout and potentially chinook salmon and bull trout. Fish travel freely along the length of the creek to the Deschutes River and the sea.

Consistent Uses: The following activities are examples of uses that are consistent with protection of the Fisheries Outstandingly Remarkable Resource Value:

- Relocating the Hydrological Gauging Station (#14075000)
- Stream restoration
- Consolidation or removal of trails, roads, and campsites in the riparian area.

- Vegetation management which meets all other direction and protects stream shade, streambanks, and provides for long term wood input.
- Low impact recreation which does not increase sediment
- Installation of scientific monitoring equipment with negligible impacts.

Conflicting Uses: The Fisheries Outstandingly Remarkable Resource Value could be adversely affected by:

- Introduction of fish which affect native population genetics or introduce disease.
- Activities which alter channel morphology.
 - Removing or cutting instream wood.
 - Driving vehicles through the channel.
 - Bridge or culvert installations which destabilize streambanks.
 - Adding riprap along streambanks.
- Activities which consistently contribute sediment beyond natural inputs.
- Vegetation management which removes future instream wood, causes erosion, or reduces streamside shade.
- Wildfire suppression techniques which may cause more damage to the creek's water quality and riparian areas than direct and indirect wildfire effects (i.e. poorly located safety zones, fire camps that could adversely impact the corridor, drop points in riparian areas, dozer lines or fire lines in riparian areas or hydrologically connected areas that lead to excessive erosion).
- Activities which could pollute the river.
 - Fire retardant or a retardant mixing plant that could contaminate the creek.
 - Herbicides or other chemicals which are not safe for aquatic use.

Existing Condition and Management Needs

Standards and guidelines from existing plans adequately protect the area's fisheries and habitat with the Aquatic Conservation Strategy and Riparian Management Objectives.

Creek boating, a subset of whitewater kayaking where paddlers seek narrow streams, fast currents and waterfall drops has increased in the upper reaches of the creek during high flows. A small number of people currently enjoy this challenging sport, however removal of wood to allow boat passage could remove valuable habitat that stabilizes stream banks and creates fish habitat.

Need: *Guidelines to prevent wood manipulation for boating.*

Guidelines to define appropriate trail locations, and monitoring to identify rehabilitation of areas adversely affected by recreational use.

Scenery (Outstandingly Remarkable Value)



The Three Sisters are the headwaters of
Whychus Creek

Desired Future Condition

The wild, unmodified scenery of the corridor is recognized as a unique and valuable attribute. The creek provides a rich variety of scenic experiences. The headwaters of Whychus Creek and the glaciers on the Three Sisters mountains, remain an iconic symbol of Central Oregon. The natural appearing landscape has little evidence of past human activities. The canyon walls provide a sense of seclusion.

Close views are dominated by the interaction of rock, water, vegetation, including large old growth trees, down wood, riparian hardwoods and other native vegetation.

The natural fire ecology of the area forests is a part of the scene. More distant views are dominated by burned and fire maintained forests and mountain vistas. Facilities for the purpose of protecting river values are rustic in character and blend with the natural surroundings.

***Consistent Uses:* The following activities are examples of uses that are consistent with protection of the Scenery Outstandingly Remarkable Resource Value:**

- Vegetation management, as allowed by other plans and standards. This may include prescribed fire or managed wildfires which move forests, meadows, riparian areas, and streamsides toward conditions within the historic range of variability (see Whychus Late Successional Reserve Assessment, 2001 and Whychus Watershed Analysis 1998 & 2009). Appropriate mitigations are required.
- Natural appearing parking areas along the road using native material and plantings.
- Installation of educational or directional signs.
- Installation of scientific monitoring equipment with negligible impacts as allowed.

Conflicting Uses: The Scenery Outstandingly Remarkable Resource Value could be adversely affected by:

- Unmanaged recreational use causing devegetation or multiple trails or roads.
- Uninformed, unskilled, or careless practices while camping (in camp location, excessive size and number of campfire rings, improper sanitation, illegal firewood cutting, leaving trash, excessive noise, and vandalism).
- Uninformed, unskilled, or careless practices while hiking or parking (parking in vegetation, improper sanitation, leaving trash, creating user trails, and vandalism).
- Illegal or undesirable behaviors such as shooting trees, graffiti, leaving trash, cutting live or dead standing trees outside firewood cutting areas, or vandalism.
- Too many signs, which detract from the scenic quality and the near natural or natural setting.

Existing Condition and Management Needs

Scenic quality can be negatively affected by unmanaged use which can create multiple user roads and trails, vandalism, erosion, and devegetation. Forest management can also impact scenery with cut trees, stumps, ground disturbance, and prescribed fire. Disturbance events such as insects and disease or wildfire have a distinctive character that will not meet some people's expectations for scenic quality, however these are natural processes occurring across the Forest landscape.

Standards and guidelines from existing management plans adequately protect the area's scenery but as the Forest management direction of the 1974 Visual Management System transitions to the newer 1996 Scenery Management System there is a need to provide a transition between the plans.

Need: *Guidelines to transition from the 1974 Visual Management System (VMS) standards and guidelines to the newer and improved 1996 Scenery Management System (SMS).*

Education on low impact practices and increased enforcement.

Cultural Prehistory and Traditional Use (Outstandingly Remarkable Values)



Warm Springs Culture and Heritage Committee members examine cedar trees

Desired Future Condition

As an ancient travel route to the mountains, the area around Whychus Creek continues to protect an important record of how people in the past used resources and the landscape. The non-renewable and generally fragile nature of prehistoric resources is recognized and they are managed accordingly for the greatest scientific and public good in consultation with the Confederated Tribes of Warm Springs.

The relationship between the Confederated Tribes of Warm Springs, the Forest Service, the community, and visitors is recognized and nurtured as an opportunity for cross cultural learning, respect, and understanding. The treaty protected resources of the corridor are protected and enhanced.

The location and extent of cultural resources is known and all have been evaluated for eligibility to the National Register of Historic Places. Outstanding heritage resources within the Wild and Scenic River area are nominated for listing on the National Register. A management plan for the heritage resources of the area identifies opportunities for education, research, and recreation access as well as priority sites for protection measures and monitoring. Locations with tribal interest and concern are identified and appropriate access, interpretation, and use is determined in consultation with tribal governments and groups.

Consistent Uses: The following activities are examples of uses that are consistent with protection of the Cultural History and Traditional Use Outstandingly Remarkable Resource Values:

- Low impact recreation (see Recreation section for more information).
- Education and interpretation of cultural and traditional history guided by the Confederated Tribes of Warm Springs
- Monitoring, surveys, and approved research
- Installation of scientific monitoring equipment with negligible impacts.

Conflicting Uses: The Cultural History and Traditional Use Outstandingly Remarkable Resource Value could be adversely affected by:

- Activities which cause damage, looting, or erosion to cultural sites, including prehistoric sites, culturally significant sites such as Whychus House Cave, or areas important for culturally significant foods such as wet meadows.

Existing Condition and Management Needs

Heritage resources including prehistoric sites and culturally significant areas are being affected by lack of management as dispersed recreation use creates more user trails, off road vehicle damage, user roads, and devegetation which increases erosion to sites.

Of special concern are damaging activities occurring at Whychus House Cave, a culturally significant site for the Warm Springs Tribes. Campfires in the cave cover it with soot. Despite road closures, there has been persistent vandalism at the cave, including: illegal road pioneering, graffiti, tree shooting, and leaving trash. Graffiti in the cave was removed in 2009 through agency and community efforts. The situation has required extra monitoring and continual clean-up. Rock climbing at the cave introduces use at the site that has marked the cave with climber chalk and devegetates certain areas.

The Confederated Tribes of Warm Springs have a long history of use in the area and have declared their interest in treaty protected resources of the river corridor. The need for coordination and consultation continues and may increase as use in the area grows.

***Need:** Guidelines to emphasize the need for protection of heritage resources which could be affected by developments, management activities, or lack of management controls.*

Protection of Whychus House Cave by the elimination of rock climbing, camping, and campfires.

Guidelines to emphasize the need for communication with the Tribes within and outside the NEPA process.



Whychus House Cave

Wildlife (Significant Value)



Pygmy Owl and pocket gopher

Desired Future Condition

The diversity of wildlife in the Whychus corridor is recognized and managed as part of a healthy riverine ecosystem. The need for habitat and security for common species is recognized and refugia are maintained and protected allowing wildlife to disperse through the corridor.

The undeveloped characteristics of the area are maintained by managing dispersed camping and user created roads and trails to minimize disturbance to wildlife species in the corridor. The upper reaches of the corridor will provide even more remoteness and solitude for those species requiring such an environment. The creek and its environs attract this variety of life because of the clean, abundant water, diversity of vegetation, and relatively low amount of disturbance by roads and other human activities.

Designated late successional (old growth) forest habitats and remnant old growth trees are managed for their unique habitat value and as part of an important habitat network. Snags are an important habitat component and appear in rich abundance in the corridor due to natural processes. Hazard tree operations provide opportunities for retention or creation of fish or wildlife habitat or adding to riparian zone complexity. Aspen, cottonwood, and other hardwoods habitats increase and provide important habitat diversity for wildlife.

***Consistent Uses:* The following activities are examples of uses that are consistent with protection of the Significant Wildlife Resource Value:**

- Low impact recreation (see Recreation section for more information).
- Vegetation management which complies with current direction and plans.
- Hunting game with appropriate permits and licenses.
- Road closures, conversions of roads to trails, and restoration of unneeded roads.
- Installation of scientific monitoring equipment with negligible impacts.

Conflicting Uses: The Significant Wildlife Resource Value could be adversely affected by:

- Actions which fragment forest or riparian habitat.
- Development of trails or roads in sensitive areas.
- Human disturbance including trails in undeveloped areas which currently function as wildlife refugia.
- Vegetation management which affects current or future habitat for species of concern or management indicator species.
- Illegal shooting of wildlife.
- Wildfire suppression techniques which may cause more damage to the creek's water quality and riparian areas than direct and indirect wildfire effects (i.e. poorly located safety zones, fire camps that could adversely impact the corridor, drop points in riparian areas, dozer lines leading to excessive erosion).
- Activities which could pollute the river.
 - Fire retardant or a retardant mixing plant that could contaminate the creek.
 - Herbicides or other chemicals which are not safe for aquatic use.

Existing Condition and Management Needs

Refugia for common wildlife species Many wildlife species currently find refuge in the corridor because of low levels of human use and relatively few roads and trails. However, user roads and system road densities exceed recommended densities. Roads can reduce habitat, increase habitat fragmentation, increase disturbance, facilitate recreational access (motorized and non-motorized) into core habitats, and reduce connectivity for dispersal among other effects.

The desire for designated river trails could result in trail development that introduces many more people into remote areas which now provide security, water, food and shelter for many common wildlife species. Multiple users trails and unneeded roads provide opportunities to consolidate use into one area or convert roads into trails and rehabilitate and restore impacted areas.

Currently no motorized boat use is believed to occur however as recreational vehicle technology advances it may become possible and would create disturbance in secluded wildlife areas.

Need:

Guidelines to emphasize protection of existing refugia in trail and other recreational planning. Also consideration of converting existing unneeded roads to trails, rehabilitation of user trails and unneeded roads to restore habitat.

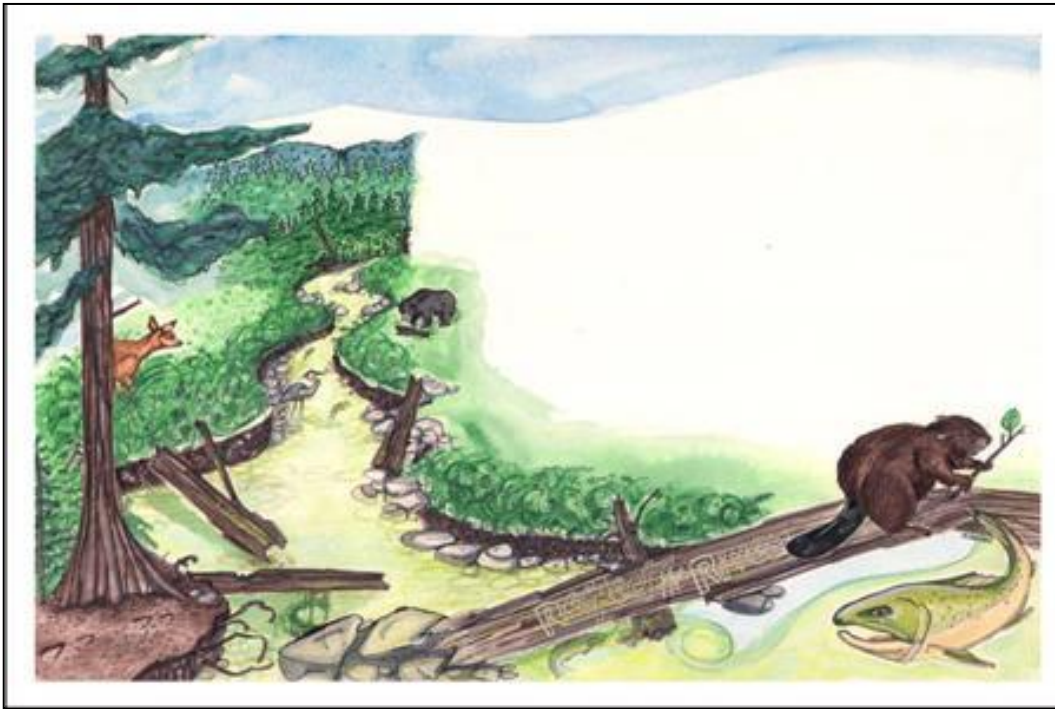
Add standard and guideline that prohibits motorized travel on water.

Change MA 17-4: from "Motorized travel on land or water may be permitted, prohibited, or restricted as necessary to protect river values to "Motorized water uses are not allowed."

Add standard to emphasize need for reducing road densities in the Wild and Scenic River corridor by closure, decommissioning, and rehabilitating closed roads to restore vegetation and wildlife habitat.

Biological Deer Winter Range and Transition Range - The lower mile of the Wild and Scenic River corridor (the terminus close to the City of Sisters) is adjacent to MA 7 - Deer Habitat and is functionally biological winter and transition range for mule deer. It needs special management for deer forage and cover.

***Need:** Add vegetation management guidelines to manage the corridor in this area with considerations for deer habitat. This also benefits other wildlife species. The pertinent guidelines apply to forage conditions, crown cover, and thermal cover.*



Common wildlife need secure habitats too

Vegetation and Ecology (Significant Value)



Desired Future Condition

Forest types follow a steep elevation and moisture gradient ranging from sparse high elevation subalpine stands to dense mixed conifer stands along deep canyons to open dry ponderosa pines on broad flats. An accompanying range of natural disturbances continue to play their role in forest renewal.

Near the mountains, hemlock and lodgepole forests cycle through periodic disturbances from fire, wind, insects, and disease. Fuel loading is at levels where periodic wildland fires may occur and replace stands at the end of their lifespan. Small to moderate size wildfires burn at moderate to high intensities to break up the continuity of fuels and create diversity.

Downstream along the slopes of the river canyon, the vegetation is dominated by wet mixed conifer forests where wildfires may be variable and burn at variable intensities to create a variety of patch sizes. These forests are healthy and resilient to periodic disturbances from fire, insects, or disease. Fuel loading is at levels where periodic wildland fires may occur, but would burn at moderate to high intensities and create diversity.

Dry mixed conifer and ponderosa pine forests are maintained by frequent low intensity fires to help restore large pine and Douglas fir. These forests are healthy and resilient to periodic disturbances from fire, insects, or disease. Fuel loading is at levels where low intensity periodic wildland fires may occur, but would cause little damage. Large old growth trees are more prevalent than today. Careful forest management practices help restore desired conditions but maintain a high level of scenic integrity and natural appearance.

Riparian vegetation along stream edges and meadows exhibits high native species diversity, from grasses, to sedges, to willows, to flowering shrubs and has little conifer encroachment. Abundant dead trees and down wood provide habitat in and adjacent to the creek. Riparian areas will be functioning effectively.

Aspen and cottonwood stands are recognized as significant habitats and managed for sustainability. Rare plants such as Peck's penstemon or special habitats such as wet meadows and swamps are managed for sustainability and protected from non-native plants and recreational impacts. Noxious weeds and other undesired non-native species are rarely found. If detected, they are removed by approved methods.

***Consistent Uses:* The following activities are examples of uses that are consistent with protection of the significant Vegetation and Ecological values:**

- Low impact recreation (see Recreation section for more information).
- Vegetation management, as allowed by other plans and standards. This may include thinning, prescribed fire or managed wildfires which move area forests, meadows, riparian areas, and streamsides toward conditions within the historic range of variability (see Whychus Late Successional Reserve Assessment, 2001 and Whychus Watershed Analysis 1998 & 2009). Appropriate mitigations are required.
- Commercial or noncommercial vegetation management and utilization activities where allowed by other plans and standards which accomplish desired management (i.e. thinning, managed firewood cutting, biomass removal). See Whychus Late Successional Reserve Assessment, 2001 and Whychus Watershed Analysis 1998 & 2009. Appropriate mitigations are required.
- Control of invasive plants.
- Restoration of impacted areas with native plant species.
- Installation of scientific monitoring equipment with negligible impacts.

***Conflicting Uses:* The significant Vegetation and Ecological values could be adversely affected by:**

- Activities which move forests, meadows, and streamsides away from the natural range of variability (see Whychus Late Successional Reserve Assessment and Whychus Watershed Analysis).
- Wildfire suppression techniques which may cause more damage to the creek's water quality and riparian areas than direct and indirect wildfire effects (i.e. poorly located safety zones, fire camps that could adversely impact the corridor, drop points in riparian areas, dozer lines leading to excessive erosion).

Existing Condition and Management Needs

Standards and guidelines from the many applicable plans generally adequately protect the area's vegetation and ecology. Two exceptions follow.

1) Refinement of Guidance for Wildfire Suppression and Wildfire for Resource Benefit.

The existing direction for fire management found in the Whychus Late-Successional Reserve Fire Management Plan for the Whychus Creek Management Strategy Area calls for "Aggressive control of all high severity wildfires that threaten the survival of large overstory ponderosa pine or areas managed for climatic climax" (USFS 2001). It allows for consideration of the use of confine and contain strategies for low intensity wildfires. Although aggressive control may be needed, the Wild and Scenic River corridor river values require special consideration and protection during suppression activities. Special habitats such steep riparian canyons and wet meadows need careful consideration during suppression actions. Forest, meadow, and other special habitats may benefit from wildfire and managers should consider managing fires for the benefit of resources where possible and desirable.

Need: 1) Clarify wildfire suppression guidelines to protect river values and allow wildfires to burn where appropriate for ecological benefit. 2) Additional standards for management of vegetation for deer habitat. See discussion under Wildlife.

Cultural History (Significant Value)



Historic wood fence

Desired Future Condition

The role of Whychus Creek in the Sisters area's history is recognized and studied. From railroad engineers exploring the area in the 1855 to the establishment of Sisters in the early 1900's, the story of settlement and resource use along the creek is the story of the exploration of the west. It is shared in educational and interpretive materials. The non-renewable and generally fragile nature of historic resources is recognized and they are managed accordingly for the greatest scientific and public good.

Consistent Uses: The following activities are examples of uses that are consistent with protection of the significant Cultural History Resource Value:

- Low impact recreation (see Recreation section for more information).
- Protection/Restoration of the area's landscape character.
- Interpretation of the area's history.
- Installation of scientific monitoring equipment with negligible impacts.

Conflicting Uses: The significant Cultural History Resource Value could be adversely affected by:

- Activities which change the area's landscape character.
- Prescribed or wild fires which burn historic wood fences or other vulnerable structures.
- Vandalism or careless destruction of fragile historic sites.

Existing Condition and Management Needs

Standards and guidelines from existing plans generally protect the area's cultural history. However, wildfire and vandalism can destroy fragile historic sites. Monitoring is required. No new standards are proposed.

Recreation (Significant Value)

Desired Future Condition

Whychus Creek's wild and remote character is valued, considered, and actively protected as a theme in future planning. It will remain a place where people can explore and experience the excitement of discovery and self reliance. Opportunities for primitive and semi-primitive recreation experiences associated with enjoying the water, forests and mountain views emphasize hiking, wildlife watching, dispersed camping, hunting, and fishing. Trails for equestrians, mountain bikers, and



A solitary moment at a waterfall on Whychus Creek

snowmobiles will enter and cross the corridor in certain areas. It will be easier for responsible users to enjoy the area and harder for people who have abused the area in the past to continue destructive behaviors.

There would be a gradient of management controls so areas closer to the City of Sisters would provide more facilities to manage use and higher reaches closer to the wilderness would provide fewer facilities. The plan would allow development of limited improvements (parking areas, system trails, restrooms) close to the City of Sisters to manage use to protect river values and provide interpretive and stewardship information.

Recreational Opportunity Spectrum (ROS) The Wild section of the river is within the Three Sisters Wilderness and is managed as Wilderness with the Recreation Opportunity Spectrum (ROS) characterization of a "Primitive River". The Scenic section of the river is managed within the Recreation Opportunity Spectrum (ROS) characterization of a "Semi-Primitive Motorized River".

Low Impact Recreation Low impact recreational practices protect Outstandingly Remarkable Values. Low impact dispersed camping avoids tree damage or vegetation loss, and low impact trail users protect trails from excessive erosion. Low impact recreation protects recreational experiences and environmental quality by respecting others, limiting group sizes, and using proper sanitation and litter disposal. Motorized travel is kept to designated routes. The concepts of low impact recreational practices are discussed in Cole 1989.

River Trails A managed river trail will lay lightly on the landscape to provide a high quality hiking experience that is protective of riparian values, wildlife refugia, and scenery. Networks of braided user trails are rehabilitated. Mountain bikers, equestrians, and snowmobile users will be able to pass through the corridor to connect to trails systems such as the Metolius Windigo Trail, the Peterson Ridge Mountain Bike Trail, or

the Cross District Snowmobile Trail. Trails will consider community connections and logical links to other existing trails to make it easier for people to enter or pass through the corridor from town by foot, bicycle, horse, snowmobile, as well as by car on open roads. Primitive roads provide access points to the river. The most logical trail corridors in some places may exist on canyon rims above the creek where views can be enjoyed, or on existing unneeded roads that could be converted to trails.

Vehicles, including off-highway vehicles will remain on designated routes and enforcement of the Travel Management Rule is effective. People limit the noise from vehicles in dispersed camping areas shared by others by traveling at slow speeds.

Boating The use of non-motorized boats by those that enjoy the challenging seasonal boating available on the creek continues with a focus on low impacts, self-reliance, and operating on a wild river where instream wood is not managed for boater passage or safety.

Dispersed Camping People continue to enjoy dispersed camping and camps are clean, soil erosion and runoff to the creek is minimized, and proper sanitation practices are followed. Low impact “Leave No Trace” camping techniques are communicated and followed.

Winter Recreation Opportunities for winter use such as cross-country skiing and over-snow machine travel are available but are protective of the outstanding and remarkable river values. The use levels and characteristics are consistent with “Primitive” and “Semi-Primitive Motorized” Recreation Opportunity Spectrum zones.



Tay Robertson and Chuck Newport enjoy a wilderness pack trip

Recreational Development

A few strategically placed recreational developments such as parking areas, restrooms, educational displays, and maintained trails will allow people to enjoy the Wild and Scenic River but will defer to and protect or enhance the river’s Outstandingly Remarkable Resource Values. Parking areas may be visible from Road 16 for security, but constructed with natural

rocks and native plantings.

A modest, fully accessible portal area close to the City

of Sisters could provide a place to view the corridor, enjoy the mountain scenery, learn about river values and philosophy, and take a walk or connect to a longer hike.

Stewardship and Volunteerism People’s experiences on Whychus Creek will be part of a sustainable public stewardship program. Volunteerism, stewardship and service to public

lands will be a part of the community culture. People of all ages will help take care of the river and value the unique experience Whychus Creek provides. The community will be known for its creative approaches to public lands stewardship.

Roads The road system provides access to some portions of Whychus Creek corridor for recreation opportunities, driving for pleasure, forest management, and effective fire-fighting capability; yet most of the corridor remains unroaded or has a very low road density in order to reduce the risk of water quality degradation occurring from roads, provide primitive and semi-primitive self discovery experiences, and provide the highest possible wildlife habitat effectiveness. The roads that remain open for access in the corridor are maintained to provide managed public access and prevent resource damage.

Trail Bridges Trail bridges which fit the areas primitive character may be built if they protect river values, can withstand Whychus Creek's winter flood events, and meet management direction for Riparian Reserves or Riparian Habitat Conservation Areas.

Permitted Recreation and Social Events Sustainable river management recognizes the important economic and social aspects of Whychus Creek. The area's primitive character and desired social setting is maintained by allowing events or activities which protect river values, promote stewardship, restoration or education and do not lastingly increase or displace general public use.

Fixed improvements Fixed improvements protect the health and safety of public, protect or enhance river values, fulfill an agency management and administrative role, or involve the study or research of values unique to Whychus Creek.

Sustainable Recreation Program Proposed new activities or developments consider the environmental, social, and economic factors that influence the creek's outstandingly remarkable and significant resource values. By working with the community, visitors, and partners the area will be able to continue to provide the mental and physical benefits of outdoor recreation while protecting and enhancing the creek's resource values for future generations.

Whychus Creek will provide a much needed sanctuary for people; a place for rejuvenation, reflection, education, and opportunities to give back in the form of public lands stewardship. Community engagement will help conserve the natural setting. The fiscal viability of decisions and investments consider the economic contribution to the community and tourism as well as capacity and sustainability.

Consistent Uses: The following activities are examples of uses that are consistent with protection of the Significant Recreation Resource Value and the Outstandingly Remarkable Resource Values:

- Opportunities for primitive or semi-primitive experiences which involve low impact recreation as discussed above.
- Horseback riding and mountain biking on system trails that cross the corridor, including the Metolius Windigo Trail.
- Management regulations or modest recreational facilities (such as parking areas or trails) which protect Outstandingly Remarkable Resource Values and wildlife refugia.

- Dispersed camping in allowed sites. Campsites are designated, rested, or decommissioned as needed.
- Road closures or obliterations for resource protection or to reduce vandalism.
- Converting roads to trails.
- Motorized access on designated routes.
- Non-motorized boating which does not require wood management.
- Winter recreation such as cross country skiing or over the snow machine travel.
- Bridges which fit the areas primitive character, protect Outstandingly Remarkable Values and are built to withstand winter floods, or can be seasonally removed.
- Small events or classes (generally under 100 people) with a primary purpose of restoration, stewardship, or resource education in Scenic river section.
- Events, including those types not generally allowed inside the river corridor may cross the Wild and Scenic River Corridor on the Rd 1514 bridge.
- Special recreational or social events requiring a permit which protect the areas non-commercial character, accomplish desired management, or benefit river values.
- Special use permits for recreation outfitters, educational groups, and others using the Three Sisters Wilderness.
- Protection of the river values, recreation experience and availability of recreation space for general public use are primary considerations in managing permitted uses.
- Fixed improvements which respond to a demonstrated need for health and safety of public, protect or enhance river values, fulfill an agency management and administrative role, involve the study or research of values unique to Whychus.
- Low key signing, off site interpretation, on-site interpretation that is consistent with the area's desired character.

Conflicting Uses: The following uses could adversely affect the significant Recreation Resource value and the Outstanding Remarkable Resource Values:

- Recreational developments which cause use to increase beyond desired social setting throughout the corridor.
- Unmanaged use which causes resource damage to Outstandingly Remarkable Resource Values.
- Installing new trails that adversely impact riparian areas, cultural sites, unstable areas or erosive soils, or wildlife refugia.
- Dispersed camping or campfires that adversely impact sensitive sites or Outstandingly Remarkable Resource Values.
- Developing campgrounds in the corridor until the hazard from seasonal flood events or a breach of the Carver Lake moraine is better understood.
- Uninformed, unskilled, or careless practices while camping (in camp location, excessive size and number of campfire rings, improper sanitation, illegal firewood cutting, leaving trash, excessive noise, and vandalism).
- Uninformed, unskilled, or careless practices while hiking or parking (parking in vegetation, improper sanitation, leaving trash, creating user trails, and vandalism).
- Illegal or undesirable behaviors such as building unauthorized roads or trails, shooting trees, graffiti, leaving trash, cutting live or dead standing trees outside firewood cutting areas, or vandalism.

- Commercial or non-commercial events, including sporting or charity events which are not tied to stewardship, restoration or education or lastingly displace opportunities or the affect the recreation experience of the general public.
- Permits authorizing special events or uses which detract from the areas non-commercial character, do not accomplish desired management, or do not benefit river values.
- Over promoting or advertising the area causing increasing use beyond desired social settings.
- Too many signs, or lack of consistency and quality in signing which detracts from the visual quality and the near natural or natural setting.

Existing Condition and Management Needs

As recreational use increases in the future, maintaining Whychus Creek's unique wild and remote character will require careful planning choices. Managers face challenges in adequately managing existing trails but there are more requests every year for even more trails and specialized trails for various user groups.

Users have created trails on the streambanks by repeated entries. Some of these trails are poorly located and unstable and causing erosion and loss of vegetation on streambanks. Some recreationists are taking matters into their own hands and building illegal trails. The desire for trails could push development and people into currently undeveloped areas which serve as refuges for wildlife, provide important riparian habitats, and are wild places that once lost, cannot be reclaimed.

Illegal activities such as vandalism, dumping garbage, graffiti, damaging or cutting trees outside firewood areas, and residing on the creek also occur.

Currently dispersed camping occurs throughout the area and in some places causes damage to streamside areas. Standards and guidelines from existing plans adequately address road access. On and Off Road Vehicle access will be governed by the Travel Management Rule and EIS.

Several sporting and social events authorized by special use permits occur in the corridor, partly on non-system user created trails, and bring hundreds of people at a time through the area. The effects of these events on the wild character of the creek, to trails, to the creek, and the desired social setting need to be reevaluated.

A sustainable thoughtfully located river trail could protect river values, avoid wildlife refuges, and provide community connections. It can be designed with logical links to other existing trails and make it easier for people to enter or pass through the corridor from town by foot, bicycle, horse, as well as by car on existing roads.

Need: Standards to guide the design of a signed and managed river trail that protects river values, while providing for public use and enjoyment. Establishing Recreation Opportunity Spectrum guidelines for river segments to help set indicators for Limits of Acceptable Change. Education on low impact use practices and increased enforcement. Criteria to allow recreational and social events which protect river values, have a purpose of restoration, stewardship, public health and safety, or resource education, protect the areas non-commercial character, or accomplish desired management.

Decision Framework

Given the purpose and need, the Responsible Official (Forest Supervisor) will review the proposed action and the other alternatives in order to make the following decision:

What should be done to protect or enhance the Outstandingly Remarkable Resource Values of Whychus Creek?

They may:

- ☐ Select the no action alternative; or
- ☐ Select the proposed action alternative; or
- ☐ Select a modified proposed action alternative.

Should a decision be made to select an action alternative or a modification of an action alternative, the actions would be documented in the Comprehensive River Management Plan and used to amend to the Deschutes National Forests Land and Resource Management Plan.

Public Involvement



Public Field Trip- July 2008

Gathering public comments about Whychus Creek, its values, and future management began in 2003 during the Resource Assessment process. Contacts were made in 2003 through mailings, e-mails, presentations to the local Watershed Council, and through interpretive events associated with “Riverfest,” a week long celebration of river - related events sponsored by the Upper Deschutes

Watershed Council. Events specific to Whychus Creek included the “Secrets of Whychus Creek” River walks and a “Charrette,” a brainstorming session to capture information and concerns. The advertising for the Riverfest events reached over 10,000 people through newspaper, radio, television, posters and mailings. Fifty- five people provided comments or participated in events in 2003.

Issues pertinent to the Wild and Scenic River corridor included: detrimental impacts to riparian areas from dispersed camping and vehicles, maintaining vehicle access, promoting self discovery, minimizing recreational developments, protection of unroaded

areas, the need for better trail locations to protect streambanks, reducing wildfire risk, and exploring educational and interpretive possibilities.

The Whychus Creek Wild and Scenic River Management Plan was listed in the Deschutes National Forest Schedule of Proposed Actions on October 2007. The project was presented to the public and other agencies for comment in a scoping letter on July 11, 2008. Nineteen people sent e-mails, letters or called.

On July 29, 2008 a public field trip to the creek was attended by twenty three people who provided oral comments. Comments centered around the need to change user groups on the creek by making low impact recreational use easier and reducing damaging use. A strong interest in volunteer stewardship was heard and the need for more education. Concerns about protecting large trees, commercial logging, post-fire salvage logging, and poor forest health in higher elevation forests due to mountain pine beetles were also discussed.

Consultation with Native American Tribes

The Whychus Wild and Scenic River corridor and the entire Sisters Ranger District are ceded lands of the Confederated Tribes of Warm Springs and are protected by treaty rights. The Tribes were contacted and provided comments by letter (Currim, 2003) and in meetings. The river values identified by the Tribes as most important were:

- **Hydrology:** Especially in regard to the headwaters that are glacially fed and the wet meadow systems.
- **Fisheries:** Especially with respect to downstream effects on habitat and the reintroduction of steelhead and spring chinook.
- **Wildlife:** Especially with respect to migratory corridors for mule deer in transition to summer range and spotted frogs within lake sites. (*Note: there are no known spotted frog sites on Sisters Ranger District*)
- **Cultural Resources and History:** Especially with respect to known cultural sites.

The Culture and Heritage Committee of the Confederated Tribes of Warm Springs also provided information. They are a group of elders with special knowledge of both history and cultural aspects important to the Tribes.

They felt Whychus Creek needed protection. The elders identified that one historic name for the creek meant “The Way to the Mountain” because people traveled along the creek as a route to higher elevations to pick berries, gather herbs, hunt deer, and pick pine nuts. They said Whychus Creek Meadow, a wet meadow site was important to protect.

They were concerned about development of recreational facilities and felt that the creek should not be promoted because they feared additional people would mean damage to the creek.

Issues

Using the comments from the public, other agencies, partner groups, and the Tribes, the interdisciplinary team developed a list of issues to address. The Forest Service separated the issues into two groups: significant and non-significant issues.

Significant issues were defined as those directly or indirectly caused by implementing the proposed action. The design of the proposed action addresses these issues.

Non-significant issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)...". The design of the proposed action does not address non-significant issues, however the discussion below explains the Team's rationale.

BOUNDARY: Where should the Wild and Scenic River Boundary be located?

The boundary for the Wild and Scenic River must be established so it best allows for protection and management of the Outstandingly Remarkable Values of the creek and so that it is surveyable and easily administered. Main roads provide the most logical and recognizable boundaries for the public and resource managers. Section lines are also easily surveyed. Buffered distances from the river, such as the default ¼ mile interim boundary are difficult to locate and administer. The acreage limit imposed by the Wild and Scenic River Act allows 320 acres per river mile to be designated in the boundary.

A detailed proposal for the Wild and Scenic River Boundary was submitted to the Deschutes National Forest in 1988 by Paul Dewey, who was involved with the designation of Whychus Creek as a Wild and Scenic River. Mr. Dewey commented that Pole Creek Swamp should be included in the river boundary. He also suggested that because the lower boundary of the "Wild" river section is at a protrusion of the wilderness boundary, that both sides of that point of the river should be managed as Wild even though the lands within 1/4 mile are not wilderness. Another person said the boundary should be as big as possible.

Response in Alternative Design:

Paul Dewey's boundary proposal was analyzed by the Interdisciplinary Team along with proposals from the hydrologist and by the land surveyor. All three proposals were remarkably similar. Pole Creek Swamp was included in the boundary because of its hydrological connection to the creek and because of its importance to the Tribes as a culturally significant wet meadow. The size of the boundary is defined by the Wild and Scenic Rivers Act and was designed to be on identifiable roads or sections lines and is just within the allowable acreage (see Boundary Analysis).

The area adjacent to the protrusion of the Wilderness boundary will be managed on the wild end of the development spectrum as part of the desired gradient of

management controls and developments which are less intensive in the river's higher and wilder reaches.

GEOLOGY: What should be done to manage and protect the Outstandingly Remarkable Geology of Whychus Creek?

Geological features can be damaged by mining, geothermal developments, or on a smaller scale by recreational rock climbing where hardware is installed.

Response in Alternative Design:

Standards in existing direction address all issues but rock climbing. New standards are proposed to require "Leave No Trace Rock Climbing" to protect geological features.

HYDROLOGY: What should be done to manage and protect the Outstandingly Remarkable Hydrology of Whychus Creek?

The risk of flooding in the City of Sisters from seasonal flood events or Carver Lake continues to be questioned and discussed. A meeting in January 2009 between scientists, government officials, and Forest Service specialists determined next steps to investigate the question with further modeling and discussions with the Federal Emergency Management Agency (FEMA). Modeling is very expensive and will require more detailed images of the landscape (LIDAR) which is in progress.

The hydrology of Whychus Creek could be affected by mining, geothermal developments, logging, unmanaged recreation, vegetation loss, erosion from roads, trails, or wildfires.

Public comments encouraged dealing with the effects of past management with road closures and decommissioning, and improving water quality and riparian conditions through watershed restoration. The importance of the habitat connectivity of the entire Whychus Creek system was mentioned because water in the lower reaches of Whychus Creek, outside the Wild and Scenic River corridor is allocated to irrigation, causing low flows and high water temperatures, which exceed state standards and affect the ability of fish and other species to utilize the upper reaches of the Wild and Scenic River.

The former USGS Gauging Station, which is a landmark for the beginning of the Wild and Scenic River corridor is now owned and managed by the Oregon Water Resources Department. The gauge is highly valued by scientists and managers for the unique long term record of stream data it has provided for the last 103 years. The Oregon Water Resources Department commented that the gauge is subject to a high degree of costly vandalism and requested reducing traffic to



Oregon Water Resources Department
Gauging Station

the area, blocking roads, or limiting foot access to the gauge site. The gauge also

provides a warning of flood events on Whychus Creek including seasonal high water or a Carver Lake dam breach.

There was internal concern about future requests for instream wood manipulation if creek boating becomes more popular on the creek.

Response in Alternative Design:

Carver Lake- The designation of Whychus Creek mandates that “*Nothing in this Act shall prohibit the construction of facilities necessary for emergency protection for the town of Sisters relative to a rapid discharge of Carver Lake if no reasonable flood warning or control alternative exists.*” The Forest Service will continue to work with City and County officials and scientists to determine and learn more about the risk of flooding. Existing direction in the Deschutes Forest Plan, Northwest Forest Plan and INFISH provide protections for the creek that would guide the design and installation of monitoring equipment. More drastic measures such as draining the lake or constructing facilities would require further analysis and approvals. Warning signs will be replaced and modified as needed. No further direction is proposed in this plan.

Impacts on Hydrology from mining, geothermal developments, logging, unmanaged recreation, erosion from roads, trails, or wildfires. Existing direction in the Deschutes Forest Plan, Northwest Forest Plan, and INFISH provide protections for the creek for these activities. The Proposed Action will provide additional clarification on trail development and wildfire management.

Cumulative Effects, Road Closures, and Restoration. Both Whychus Watershed Analyses (1998, 2009) determined that road densities in the area exceed guidelines of the Deschutes Forest Plan and recommended closure and rehabilitation of unneeded roads, especially near the creek and riparian areas. Almost half the roads in the proposed corridor are Level 1 Roads which have been closed to public use by past management decisions (Level 1 Roads make up 8 out of 18 miles of total roads). Road closures have not been physically implemented on all these roads. These Level 1 roads are not part of the open designated system of roads and will not be shown on the Motor Vehicle Use Map that will be published in accordance with the Travel Management Rule (36 CFR 212). The proposed action will provide additional direction on roads closures and rehabilitation to benefit streamside areas and wildlife habitat.

Many of the restoration projects outlined in the 1998 Whychus Watershed Analysis are underway throughout the watershed. The proposed action will provide direction to close and restore user trails, roads, and move, close or rehabilitate dispersed camping areas where unacceptable impacts occur to riparian vegetation, streambanks or water quality. Reducing road density is proposed in this plan.

Connectivity of the Creek. The Whychus Watershed Analyses (1998, 2009) address the urgent priority of reestablishing hydrological connectivity in the Whychus Creek system and the Forest Service and many partners and private landowners have been working to increase flows for the past decade. These activities will continue outside the project area. No flows are diverted in the

project area. Restoration of riparian areas inside the Wild and Scenic River corridor will reduce sediment and improve water quality as user trails are consolidated or eliminated.

The Hydrological Gauging Station. The Forest Service contacted the Oregon Water Resources Department (OWRD) to further discuss how to protect the gauge. The OWRD would like to move the gauge in the near future because of changes to the channel near the gauge intake that are compromising data collection. New gauging stations are very small, largely buried or instream, and almost undetectable so they will be easier to protect and visually less obtrusive. When the OWRD decides to replace the gauge, an environmental analysis will be completed for the new installation and for the removal and restoration of the old gauging station site. The existing site is and will remain a boundary point for the start of the Wild and Scenic River designation.

Instream wood manipulation for boating. There is currently little boating on Whychus Creek because it has many log jams, is too shallow much of the year, or is very dangerous and impassable most of the year. Under high water conditions some people enjoy creek boating or kayaking in the creek. The proposed action will include a new standard that wood manipulation for boater passage is not allowed in order to protect hydrological stability and fish habitat.

FISHERIES: What should be done to manage and protect the Outstandingly Remarkable Fisheries of Whychus Creek?

Fish populations could be affected by activities which reduce instream habitat complexity, increase erosion and produce sediment that harms spawning gravels, or by increasing stream temperature from loss of stream shade. Fishing on the creek is currently rare because of the small size of fish and lack of accessibility but could increase in the future. People commented that the lack of water and fish barriers (dams) in the lower reaches of the creek affect the connectivity of the whole river system. One person was concerned about genetic interactions from brook trout and resident and anadromous fish and asked that the Oregon Department of Fish and Wildlife (ODFW), stop stocking high lakes with outlets into the Whychus system.

Response in Alternative Design:

Impacts on Fisheries from activities which reduce instream habitat complexity, increase erosion, produce sediment, or increase stream temperature. Existing direction in the Deschutes Forest Plan, Northwest Forest Plan, and INFISH provide protections for the creek from activities with these effects. The Proposed Action will provide additional clarification on trail development and wildfire management and include a new standard that instream wood manipulation is not allowed for safe boat passage. Rare situations may arise where instream wood must be removed to protect infrastructure like bridges or downstream diversions.

Connectivity for Fish. The Whychus Watershed Analysis (1998, 2009) addresses the urgent priority of reestablishing connectivity and fish passage in the Whychus Creek system and the Forest Service and many partners and private

landowners have been working to increase flows and eliminate barriers for the past decade. These activities will continue outside the project area. No man made fish barriers or flow issues exist on Whychus Creek in the Wild and Scenic River corridor. Some tributaries to the creek have culverts which can affect fish passage and the natural connection of flow from Pole Creek could be improved.

Fish genetics. The Forest Service works cooperatively with the Oregon Department of Fish and Wildlife (ODFW), advises them of issues, and reviews their stocking schedules. Fish stocking is managed by ODFW's Fish Management Plan. ODFW is aware of genetic concerns and works to avoid conflicts. Recent stocking records indicate that no hatchery fish were stocked in lakes that drain into Whychus Creek, however there are self-sustaining populations of brook trout in these lakes.

Brook trout, largely escaping from wilderness lakes, make up less than 10% of the fish in the creek and do not appear to be successfully competing with Redband Trout or expanding their distribution and numbers.

SCENERY: What should be done to manage and protect the Outstandingly Remarkable Scenic Resources of Whychus Creek?

Scenery could be affected by vegetation management, vandalism, trash and dumping, and unmanaged use creating user trails and harming vegetation. Comments were concerned with the potential negative effects of vegetation management on scenery and encouraged minimal low impact vegetation management.

Response in Alternative Design:

Impacts on Scenery from unmanaged use. New standards for reducing multiple user trails, education on low impact methods, and better management and monitoring of dispersed camping areas will improve foreground scenery.

Impacts on Scenery from vegetation management. Scenic quality standards for the corridor are defined in the proposed action and require "Preservation" or "Very High" Scenic Integrity in the Wild section of the river and "Retention" or "High Scenic Integrity in the Scenic section of the river. The VQO of Retention is equal to the SMS) of "High". "High Scenic Integrity" requires that vegetation treatments appear natural and generated slash is rapidly removed.

PREHISTORY and TRADITIONAL USE: What should be done to manage and protect the outstandingly remarkable cultural prehistory and cultural traditional use of Whychus Creek?

Elders of the Confederated Tribes of Warm Springs said they feel Whychus Creek needs protection. The elders identified the creek corridor as a traditional route to higher elevations to pick berries, gather herbs, hunt deer, and pick pine nuts. They said Whychus Creek Meadow, a wet meadow site was important to protect. They were concerned about development of recreational facilities and felt that the creek should not be promoted because they fear additional people would increase damage to the creek.

Several important sites are threatened by vandalism, inappropriate use, and rock climbing. There is interest in the community for more interaction with the Confederated

Tribes of Warm Springs to learn about the history of the area. People commented that graffiti should be removed, climbers should be asked to not use chalk on culturally significant rock shelters, and educational efforts should be increased.

Response in Alternative Design:

Impacts to Whychus House Cave. The proposed action will include a new standard to eliminate dispersed camping, campfires, and rock climbing in Whychus House Cave to protect this important cultural resource.

Impacts on cultural resources from vandalism. Increased monitoring of known sites such as the Whychus House Cave would help reduce vandalism. Education may also help reduce some destructive use. Graffiti removal is in progress.

Impacts on cultural resources from recreation, including rock climbing. A restriction on climbing at Whychus House Cave is proposed (above). “Leave no trace” rock climbing standards are proposed for other rock shelters. Educational efforts would involve rock climbing groups in stewardship.

Impacts on cultural resources from recreational developments and increased popularity. Development of recreational facilities on the creek would be minimal, close to town, and focused on protecting river values by managing use. Interpretive work would be low-key and of consistent design and highlight the importance of maintaining wild places and river values. The Forest Service would not promote commercial activities or events however activities that promote public education or stewardship of the area may be allowed.

Protection of wet meadows Whychus meadow and Pole Creek swamp are included in the river boundary and are protected by many existing standards.

Increased education about Tribal history and culture Interpretive work would include tribal culture and history as part of the discussion of river values. The Tribes continue to be a partner and are invited to help design how their story is told.

WILDLIFE: What should be done to manage and protect the Significant Wildlife of Whychus Creek?

Recreational developments such as trails can introduce disturbance, degrade habitat, and displace wildlife. The importance of undeveloped portions of the creek as a refuge for wildlife was identified both internally by the ID Team and by the public. How to protect these areas from recreational developments, the effects of any development on species of concern, and cumulative effects of past management were raised as issues. One comment noted that management plans for the creek need to include long term protective provisions and recovery objectives for native species of concern, cumulative effects, and ecosystem and habitat connectivity. Other comments noted that hardwoods are important habitats for wildlife and should be restored. The need to manage lower portions of the corridor for deer habitat was an internal issue and also relates to the Tribes concern for deer migration.

Response in Alternative Design:

Impacts on wildlife refugia by recreation The proposed action includes a new standard that requires wildlife refugia be protected by avoiding placing trails in unroaded wild sections of the creek. Road closures or conversion of roads to trails can also help reduce disturbance and are proposed as mitigation. By reducing unmanaged use on multiple user trails, the area of disturbance would be reduced. Any ground disturbing action must be analyzed under a separate analysis and must be compliant with all existing direction for species protection and recovery and must address cumulative effects and connectivity.

Restoration of hardwood habitats This is part of the desired future condition for the creek and part of existing direction of the Whychus Late Successional Reserve Assessment and Watershed Analysis. It is highlighted with a proposed new standard.

Deer habitat New standards are proposed for the lower corridor to protect deer habitat.

ECOLOGY/BOTANY: What should be done to manage and protect the significant ecology/botany of Whychus Creek?

Ecological and botanical values of the creek can be affected by changes to disturbance regimes caused by exclusion of fire, high intensity wildfires, fire suppression activities, vegetation management, mining, geothermal developments, recreational use and the introduction of invasive species. Existing direction provides direction on vegetation management to improve and sustain riparian areas and old growth forests. Existing direction also provides standards for other impacts such as geothermal or mining developments

Comments recommended the development of a comprehensive weed management plan, restoration of hardwoods, concerns about insect infestations and mortality in lodgepole pine forests, removing large trees and salvage logging.

Response in Alternative Design:

Invasive plants Invasive plant management in the area was planned and analyzed under a separate analysis in the Deschutes/Ochoco Invasive Plant Environmental Impact Statement (USFS 2009). Stewardship and volunteerism in the area would include invasive species control. Any ground disturbing activity would require an invasive plant risk assessment and a plan to prevent invasive plant spread.

Vegetation management, large trees, and salvage logging The majority of the corridor is within Late Successional Reserves to be managed for old growth habitats or in the Three Sisters Wilderness where vegetation management is minimal (trail clearing, wildfire management). Watershed Analysis and Late Successional Reserve Assessments have identified the lack of large trees and snags and the need to protect existing large trees and grow more. Any vegetation management in the corridor must protect or enhance river values. Large old trees,

replacement trees, and abundant dead trees in riparian areas are part of the desired future condition.

Existing direction is protective of forest and riparian vegetation and requires a natural or near natural appearance. It is also required that dead or dying trees adjacent to the river be evaluated for their value to hydrology, fisheries, and wildlife as well as any safety and disease control risks they may pose. No new standards and guidelines are proposed for vegetation management except for improving deer habitat and restoration of hardwoods, as discussed above.

Lodgepole forest mortality The die-off of lodgepole forests in the area is distressing to some people, however it is part of the natural cycle of these high elevation forests and needed by many wildlife species which depend on abundant snags, abundant down wood, and the eventual stand replacement fires which restart this type of forest. Allowable activities for lodgepole forest are addressed in the Whychus Late Successional Reserve Assessment (USFS 2001) and no new standards are proposed.

Suppression of wildfires and allowing wildfires to burn for resource benefit The important role of fire in maintaining forests and habitats is recognized and discussed in detail in the Whychus Watershed Analysis and Late Successional Reserve Assessments. However, wildfire suppression philosophy continues to change and is now more permissive in allowing wildfires to burn for resource benefit under appropriate conditions. New standards are included in the proposed action to guide fire specialists in evaluating benefits of wildfire to resources and protecting river values from suppression actions.

Restoration of hardwood habitats Discussed above.

HISTORY: What should be done to manage and protect the Significant Cultural History of Whychus Creek?

People are interested in the history of the area and this can be part of interpretive and educational materials.

Response in Alternative Design:

No new standards are proposed.

RECREATION: What should be done to manage and protect the Significant Recreational Value of Whychus Creek?

Most of the public comments were about recreation management and were remarkably consistent in their tone in recognizing the value of the wildness of Whychus Creek. It is recognized by both the Forest Service and the public that the undeveloped character of the river corridor and the ability for self discovery so close to the city of Sisters is unique and valuable. It needs to be maintained as much as possible in future planning. This includes everything from low key publicity to low key but consistent and attractive signing to complement the character of the area.

People were concerned about areas that are subject to repeated vandalism and misuse and said this abusive behavior needed to be eliminated. Increased enforcement and public education were suggested.

Public comments also recognized that the area needs more recreation management and some developed facilities, especially close to the city, because people are building their own trails and creating networks of user trails. Some felt that making the area more accessible for low impact, responsible users would help monitor and displace irresponsible users.

People asked that off road vehicles and recreation such as dispersed camping be managed to prevent impacts to riparian vegetation and instream habitat and that degraded areas be restored as a major part of the Comprehensive River Management Plan. There was an interest in trails that connect to other trails and trails that provide a variety of experiences. People had suggestions for developing foot trails which could be located a fair distance from the creek, having secondary trails which access streamside features from a higher trail, and having no new trails in riparian areas. The need for several primitive footbridges and a bridge to replace a recently decommissioned snowmobile bridge for the Cross District Snowmobile Trail were mentioned. Road closures, limiting motorized access, making parking more visible for enforcement purposes, and the need to regulate and prevent damage by off road vehicles were suggested by several people. One person advocated for a trail from Sisters to the Wilderness boundary for hikers and mountain bikers on one or both sides of the creek.

Many of the impacted riparian areas are associated with dispersed camping and people commented that these areas needed to be restored, defined, or even eliminated.

Response in Alternative Design:

Maintaining the wild character The desired future condition described in the document reflects the goal of keeping the creek wild and as a place for self discovery. The Recreational Opportunity Spectrum characterization for the Scenic river would be “Semi-Primitive Motorized” which describes a largely undisturbed environment with little evidence of human development, rustic facilities primarily for site protection, few contacts with others, subtle on-site controls, and very few trailed access sites and primitive roads. The Wild section of the river would continue to be managed as Wilderness. Areas which are good refuges for wildlife would be left wild and road closures would help restore habitats. Motorized boating would not be allowed. Commercial and special use permits for recreational and social events or other activities such as special forest products would be limited to those which protect or enhance river values, have a purpose of restoration, stewardship, or resource education, protect the areas non-commercial character, or accomplish desired management.

Detecting damaging use The monitoring plan for the creek would increase systematic monitoring of trouble spots, habitats, and important cultural sites. Managing recreation use with visible roadside parking would help enforcement and monitoring of use. Defined trails would help bring more responsible users and volunteer river stewards into the area to help detect and report problems.

Trails River trails would be designed to allow access to some areas but be stable, protect river values, sensitive riparian areas, and habitats. Riverside trails would be limited to foot trails to protect soils and reduce erosion. Trail systems would consider community connections with existing trail systems. Trails may be located above the creek on canyon rims where needed. One person's idea of putting a trail along both sides of the entire creek to the wilderness was considered but eliminated as an alternative because it would affect the wild character and desired social setting to see people on both sides of the creek as well as impact wildlife refugia.

Dispersed camping and campfires Dispersed camping areas and campfires would be evaluated for unacceptable impacts to riparian vegetation or cultural sites and rehabilitated, rested, relocated or closed or removed if needed. Use regulations such as camping an allowable distance from the creek, camping or no camping, use or no use of campfires may be needed to protect river resource and social values.

The Deschutes Ochoco Travel Management Project (in progress) would allow for motorized access to dispersed camping sites within 300 feet of the open designated route for the same class of vehicle and season of use as the road. For roads within 300 feet of a stream wetland, or waterbody, motorized access for dispersed camping would be allowed only to designated defined sites no closer than 30 feet to the edge of the stream, wetlands, or waterbody.

On and Off Road vehicles The Deschutes Ochoco Travel Management Project (in progress) prohibits motorized travel off Designated Routes and designates the types of vehicles allowed and season of use for existing routes. Increased monitoring and enforcement would help detect damaging use.

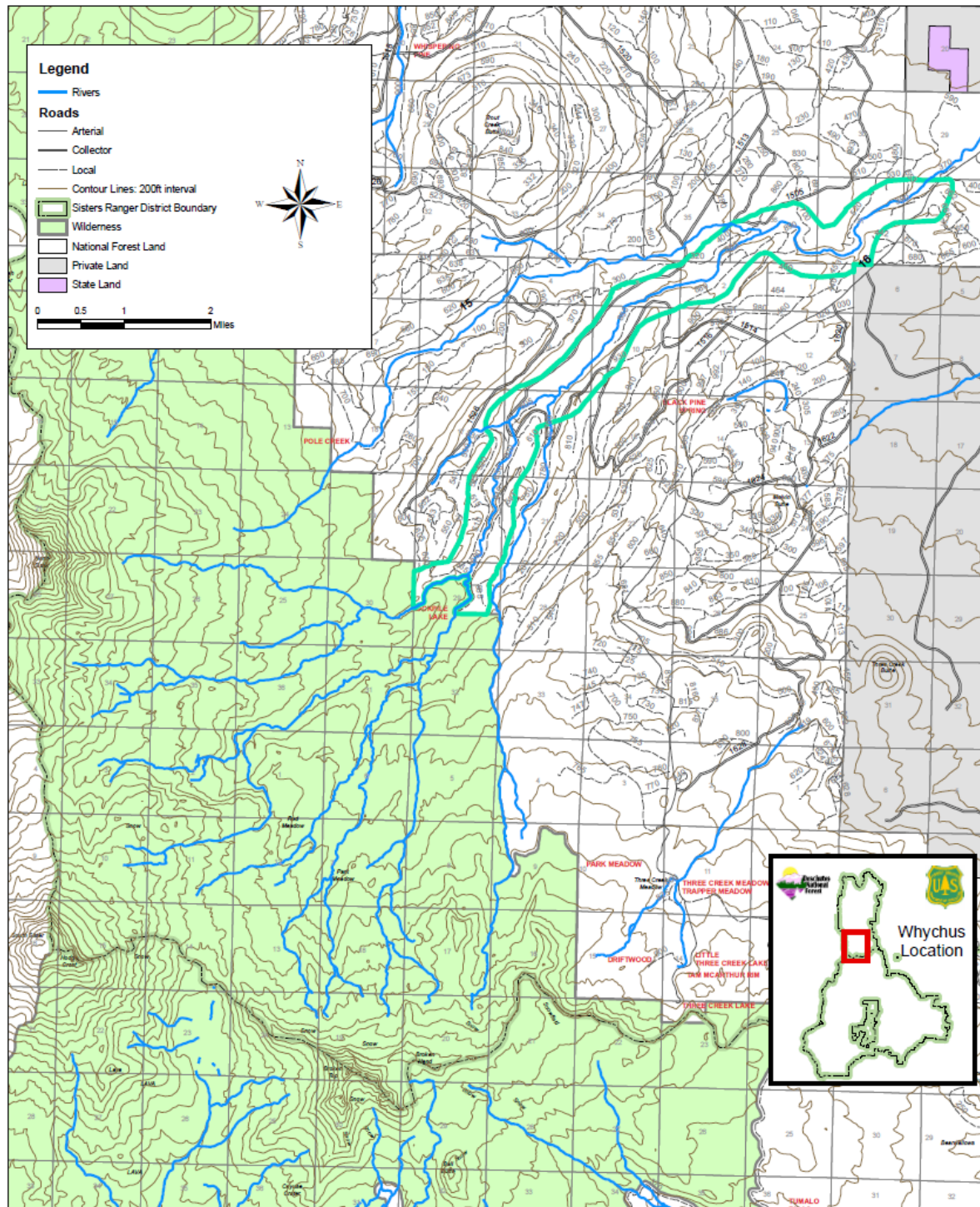


Figure 1. Alternative 1 – No Action- Use Existing Direction

ALTERNATIVES, INCLUDING THE PROPOSED ACTION

The Wild and Scenic Rivers Act requires the Forest Service to establish corridor boundaries and develop a Comprehensive River Management Plan for the river's public use, development, and administration. The 1990 Deschutes National Forest Land and Resource Management Plan provided general direction to protect and enhance the Outstandingly Remarkable Values on all Wild and Scenic Rivers on the Forest. The direction in the Forest Plan was intended to be temporary until the river planning process, and appropriate river specific management plans could be completed.

In developing the proposed action, the Interdisciplinary Team reviewed existing direction (Forest Plan and amendments), existing conditions (Resource Assessment, Watershed Analysis, Late Successional Reserve Assessment), and Tribal and public comments. New standards and guidelines became part of the Proposed Action where Outstandingly Remarkable Values or other river values were declining or predicted not to meet the desired future condition without additional management, (see Chapter 1).

This chapter describes and compares the alternatives considered for the Whychus Creek Wild and Scenic River Plan. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, defining the differences between the alternatives and providing a clear basis for choice among options by the decision maker and the public.

Alternatives

Alternative 1- No Action

Under the No Action alternative, current management plans would continue to guide management of the project area. The corridor boundary would be located approximately ¼ mile from the banks of the creek. No additional standards would be implemented to accomplish project goals. The direction from the Deschutes Land and Resource Management Plan, as amended, including direction for Management Area 17 (Wild and Scenic Rivers) would remain unchanged. See discussion under **Chapter 1, Management Direction** to see other plans that apply to the area and analysis incorporated by reference.

Goal

To protect and enhance those Outstandingly Remarkable Values that qualified segments of ... Whychus Creek for inclusion in the National Wild and Scenic Rivers System.

General Theme and Objectives

The primary objectives would be to protect the outstandingly remarkable values identified for the river and for maintaining the free-flowing nature of the river. The difference between the "Wild" and "Scenic" sections of the river is measured by the degree of development, appropriate types of land use and ease of accessibility by roads or trails.

Proposed Whychus Wild and Scenic River Boundary

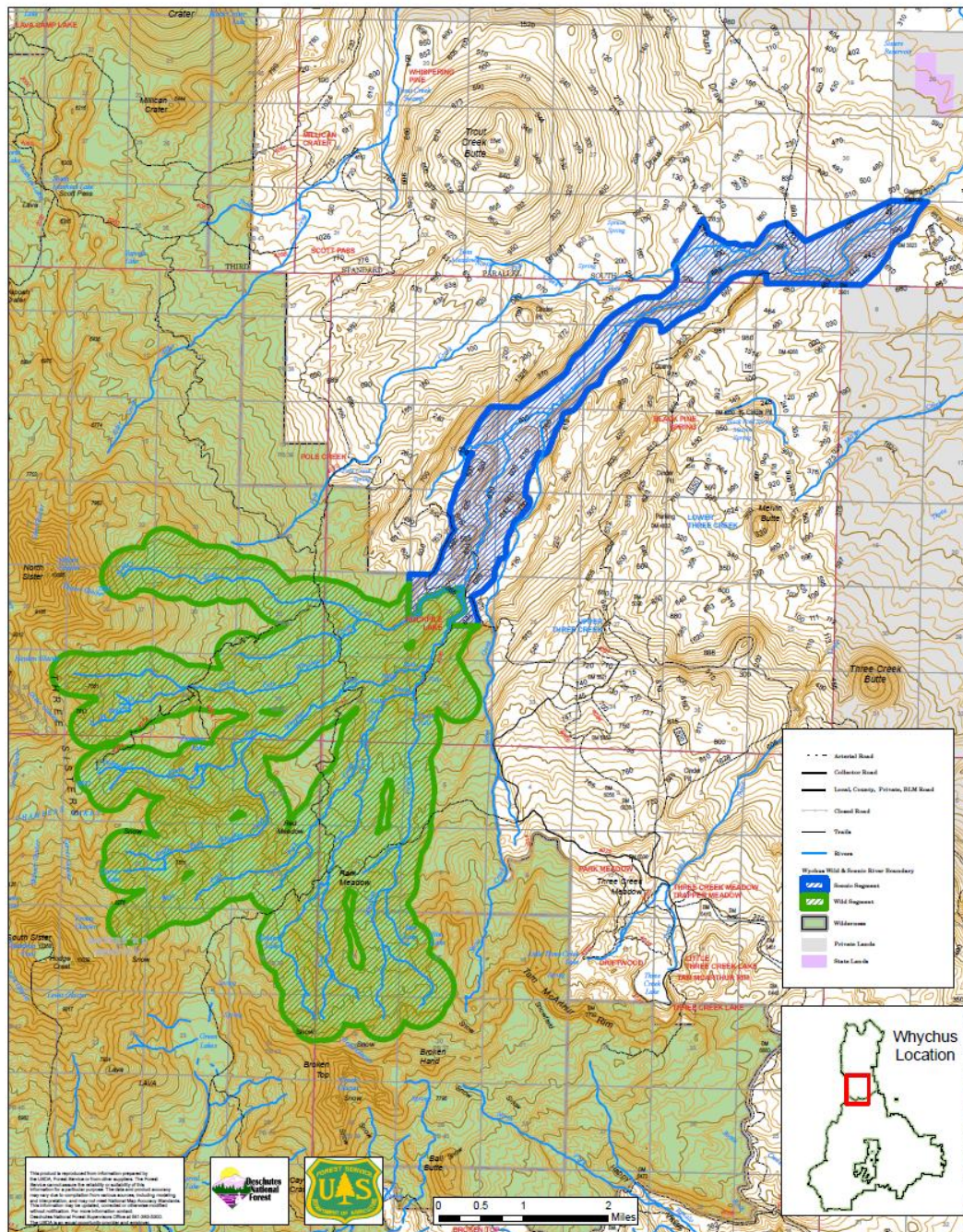


Figure 2. Alternative 2- Proposed Action.

Alternative 2 -The Proposed Action

The action proposed by the Forest Service to meet the purpose and need would establish a new boundary and require a non-significant plan amendment to the Deschutes National Forest Land and Resource Management Plan to incorporate additional standards and guidelines. The elements of this alternative would serve as the basis for a Comprehensive River Management Plan for Whychus Creek Wild and Scenic River. All elements of the alternatives are entirely programmatic in nature. Future actions would require appropriate NEPA documentation.

Goal

The goal of the proposed action is to protect and enhance the outstandingly remarkable values of Whychus Creek, restore degraded resources, and maintain the creek's wild and remote character.

General Theme and Objectives

The Comprehensive River Management Plan would consist of existing direction in the Forest Plan as amended, as well as additional standards and guidelines needed to protect Outstandingly Remarkable Values or other river values. Rehabilitation and management of recreational use would be accomplished through future site specific actions or projects. Long term protection of the creek's Outstandingly Remarkable and Significant Values would be provided. Monitoring is a prominent part of the Management Plan in Alternative 2 using the Limits of Acceptable Change concept to focus on the desired future condition, rather than on how much use an area can tolerate.

Wild Segment

Management of the wild segment of the river corridor from its mountain headwaters on the glaciers of the Three Sisters to the Wilderness Boundary would be focused on protecting and preserving natural processes with minimal human influences. Recreation management would be designed to provide the most primitive, natural, and remote setting possible. Access to the area is limited to trails in the Three Sisters Wilderness.

Scenic Segment

Management of the Scenic segment of the river corridor from the Wilderness boundary to the hydrological gauging station 4 miles south of the City of Sisters would focus on maintaining and enhancing the near-natural environment. The riverbanks would be largely undeveloped and primitive, but would be accessible in places by roads or trails. Inaccessible areas which currently have little use and which provide high quality wildlife refugia would be retained.

The area would have a natural-appearing setting with limited improvements. A few recreational facilities close to the City of Sisters would be developed to manage use to protect river values and provide interpretive and stewardship information. Recreational facilities such as trails or dispersed camping areas would be designed or managed to protect riparian areas, relocated, or removed. Access points such as trailheads, parking areas, information kiosks, or viewpoints would be strategically located in the corridor or adjacent to the corridor to manage recreation use. There would be a gradient of

management controls so areas closer to the City of Sisters provided more facilities to manage use and higher reaches closer to the wilderness had less.

New standards would address protection of geological features, in stream wood, wildlife refugia and habitats, and cultural resources from recreational impacts. Additional standards guide vegetation management to protect deer habitat. Standards would define appropriate trails and locations.

All Segments

Opportunities would be provided for primitive and semi-primitive recreation experiences associated with enjoying the water, forests and mountain views while hiking, watching wildlife, camping, hunting, and fishing.

Primitive recreational experiences are non-motorized, in unmodified natural environments with very little evidence of human development, with rustic facilities for site protection but not user comfort, where few people are encountered.

Semi-primitive recreation experiences are generally within ½ mile from primitive roads, in a largely undisturbed natural environment with little evidence of human development, minimal facility development primarily for resource protection, where low to moderate numbers of people may be encountered (6-15 small groups of people/day).

Additional clarification for wildfire suppression or management of fire for the benefit of natural resources would be provided.

Interpretation of the river values of Whychus Creek would be available in various forms to the public from low-key off-site interpretive materials to interpretive displays at appropriate locations.

Appropriate recreational or social events would be those which maintain the creeks character, accomplish stewardship, restoration, or education and do not lastingly affect the recreation opportunities or experience for the general public. They would be authorized through special use permits.

Development of fixed improvements would be permitted on a case by case basis if they respond to a demonstrated need for public safety, fulfill a goal of this plan, fulfill an agency management role or involve research of values unique to Whychus Creek.

Recreation management would be designed with sustainability in mind by: 1) considering environmental, social, and economic factors that will influence the sustainability of the creek's outstandingly remarkable and significant resource values, and 2) working with the community, visitors, and partners to provide the mental and physical benefits of outdoor recreation while protecting and enhancing the creek's resource values for future generations. The Forest Service would continue to work closely with state and local governments, partner organizations, and the public to encourage stewardship and develop community volunteerism.

Carrying Capacity and Use Limits

Recreational capacity would be established by defining desired future resource conditions and recreational experiences and by providing information on consistent and inconsistent uses. The Recreational Opportunity Spectrum (ROS) characterization for each river segment helps define appropriate levels of development for settings which include: access, remoteness, naturalness, facilities and site management, social encounters, and visitor management. Standards would define appropriate trail locations and allowable authorized uses to help maintain desired social settings over time. Monitoring would indicate the need for management actions necessary to maintain desired conditions.

Alternatives Considered but not Analyzed in Detail

One person commented that the Forest Service should put a trail along both sides of the entire creek to the wilderness for hikers and mountain bikes. An alternative that would allow more trail development along the creek was considered but not analyzed in detail because of its impacts to riparian areas, wildlife refugia, the desired wild and remote character, and desired carrying capacity and social setting (which would be affected by more use and seeing people on both sides of the creek).

Comparison of Alternatives

This section provides a comparison of the alternative by issue.

Table 3 - Whychus Creek Wild and Scenic River Alternative Comparison

Topic/Issue	Alternative 1	Alternative 2
Boundary	Approximately ¼ mile from the banks of the creek.	Scenic- Modified to include hydrologically connected areas, including Pole Creek Swamp, and be more easily located and enforced by using roads, and section lines. Wild- The boundary is set at a default ¼ mile because Wilderness standards are more restrictive.
Geology	Use existing direction from: DLRMP - MA-17 & 6 and Forest wide standards including Minerals and Energy Resources	Use existing direction and add standards and guidelines for “Leave No Trace Rock Climbing”.
Hydrology	Use existing direction from: DLRMP- MA-17 & 6 and Forest wide standards including Riparian Areas, Water and Soils Best Practices, Riparian Areas, and Northwest Forest Plan, INFISH, Clean Water Act	Use existing direction and add standards and guidelines to manage recreation use and prevent wood manipulation for boating.
Fisheries	Use existing direction from: DLRMP - MA-17 & 6 and Forest wide standards including Riparian Areas, Water and Soils Best Practices, Riparian Areas, Fisheries, and Northwest Forest Plan, INFISH, Clean Water Act.	Use existing direction and add standards and guidelines to manage recreation use and prevent wood manipulation for boating.
Scenery	Use existing direction from: Deschutes Land and Resource Management Plan- MA-17 & 6 and Forest wide standards for scenery as applicable	Use existing direction and add standards and guidelines to provide a crosswalk from the Visual Management System to the Scenery Management System. Promote low impact recreation practices and increase enforcement.
Cultural Prehistory and Traditional Use	Use existing direction from: DLRMP - MA-17 & 6 and Forest wide standards including Caves, Cultural Resources, Law Enforcement	Use existing direction and add standards and guidelines to emphasize the need for protection of heritage resources, eliminate rock climbing, camping, and campfires at Whychus House Cave, and emphasize increased communication with the Tribes.

Topic/Issue	Alternative 1	Alternative 2
Wildlife	Use existing direction from: DLRMP - MA-17 & 6 and Forest wide standards including Wildlife, Riparian Areas, Law Enforcement, and Northwest Forest Plan, Eastside Screens, INFISH.	Use existing direction and add standards and guidelines emphasizing protection of refugia in trail planning, prohibiting motorized travel on water, reducing road densities, rehabilitation of closed roads for habitat, and vegetation management guidelines to maintain Deer Habitat and enhance hardwoods.
Vegetation and Ecology	Use existing direction from: DLRMP - MA-17 & 6 and Forest wide standards including Forest Health, Timber Management, Riparian Areas, Fuelwood, Fire and Fuels Management, Law Enforcement, and Northwest Forest Plan, Eastside Screens, INFISH, and Regional Weed EIS .	Use existing direction and add standards and guidelines to clarify how to protect river values during wildfire suppression or when allowing fires to burn to benefit resources and enhance hardwoods.
Cultural History	Use existing direction from: DLRMP - MA-17 & 6 and Forest wide standards including Cultural Resources, Law Enforcement	Use existing direction
Recreation	Use existing direction from: DLRMP - MA-17 & 6 and Forest wide standards including Recreation, Transportation System, Special Uses, Riparian Areas, Law Enforcement, and Northwest Forest Plan, Eastside Screens, and INFISH.	Use existing direction and add standards and guidelines for the design of a sustainable river trail that protects river values, while providing for public use and enjoyment, establish Recreational Opportunity Spectrum (ROS) guidelines for river segments to help set indicators for Limits of Acceptable Change. Promote low impact recreation practices and increase enforcement.
Commercial and Special Uses	Use existing direction from: DLRMP - MA-17 & 6 and Forest wide standards including Recreation, Special Uses, Law Enforcement, and Northwest Forest Plan, Eastside Screens, INFISH.	Use existing direction and add standards and guidelines which limit commercial and non-commercial events or special uses to those which protect river values, have a purpose of restoration, stewardship, or resource education, protect the areas non-commercial character, or accomplish desired management.

Management Direction References:

- **DLRMP**- Deschutes Land and Resource Management Plan, as amended (USFS 1990)
- **Northwest Forest Plan**- Record of Decision for Management of Habitat for Late-Successional and Old Growth Forest Related Species within the Range of the Northern Spotted Owl”(USFS and BLM 1994)
- **Eastside Screens** – “Revised: Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales, Regional Forester’s Forest Plan Amendment #2” (USFS 1995)
- **INFISH**- Inland Native Fish Strategy (USFS 1995)
- **Clean Water Act** (1977, as amended in 1982)
- **Regional Weed EIS** - Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program (USDA, 2005)

Mitigation

All elements of the alternatives are entirely programmatic in nature. Future actions would require appropriate NEPA documentation and mitigation measures to eliminate, reduce, or compensate for potential impacts.

No mitigation measures are proposed for this plan.



Three Sisters Wilderness

Comparison of Alternative Effects

This section provides a summary of the effects of implementing each alternative on the Outstandingly Remarkable Value (ORV) and other river values or issues.

Table 4 - Whychus Creek Wild and Scenic River Alternative Effects Comparison

Topic/Issue	Alternative 1	Alternative 2
Boundary	Boundary does not include Pole Creek swamp, a significant hydrological and cultural feature and is difficult to locate on ground and enforce. Some hydrologically linked uplands are excluded.	Boundary includes Pole Creek swamp, a significant hydrological and cultural feature, is easier to locate and enforce because it is tied to roads and section lines, and better protects hydrologically linked uplands.
Geology	Standards generally adequate to protect ORV. However, there is no provision that addresses rock climbing so damage may occur as use increases	New standards and guidelines to require "Leave No Trace" Rock climbing would protect rock features, highlight stewardship, and provide educational opportunities for low impact behaviors. Programmed monitoring helps detect problem areas.
Hydrology	Standards generally adequate to protect ORV. However, wood manipulation by boaters is not tracked or prohibited affecting stream structure	New standards and guidelines to prohibit instream wood manipulation by boaters and the new standard to manage trails and recreational use will protect vegetation and would protect stream structure, highlight stewardship, and provide educational opportunities for low impact behaviors. Programmed monitoring helps detect problem areas.
Fisheries	Standards generally adequate to protect ORV. However, wood manipulation by boaters is not tracked or prohibited affecting fish habitats.	New standards and guidelines to prohibit instream wood manipulation by boaters would protect fish habitat, highlight stewardship, and provide educational opportunities for low impact behaviors. Programmed monitoring helps detect problem areas.

Topic/Issue	Alternative 1	Alternative 2
Scenery	Standards generally adequate to protect ORV. Some impacts to scenic quality from unmanaged use and illegal behaviors. No cross walk exists between the Visual Management System and the new Scenery Management System.	New standards and guidelines to manage trails and recreational use would protect vegetation and improve and protect scenic quality. behaviors. Programmed monitoring helps detect problem areas.
Cultural Prehistory and Traditional Use	Standards generally adequate to protect ORV. However, some cultural sites are not regularly surveyed or monitored in the area because few system trails or facilities exist.	New standards and guidelines to manage trails and recreational would reduce impacts on cultural sites. Elimination of rock climbing, camping and campfires at Whychus House Cave would protect this important site from damage. Guidelines which emphasize increased communication with the Tribes would help determine appropriate management actions and guide educational and interpretive information. Programmed monitoring helps detect problem areas.
Wildlife	Standards generally adequate to protect ORV. However, important deer habitat in lower corridor is not optimally managed. Road densities exceed recommendations for wildlife habitat security. Motorized boating could affect habitat security in the future.	New standards and guidelines to manage trails and recreational would reduce impacts on habitat. Emphasizing protection of wildlife refugia benefits many species and helps maintain desired social setting. Managing additional areas for deer habitat in the lower corridor and hardwood habitats would benefit other wildlife species as well. Reducing road densities and restoring vegetation would increase available habitat. Prohibition on motorized boating would reduce disturbance. Programmed monitoring helps detect problem areas.

Topic/Issue	Alternative 1	Alternative 2
Vegetation and Ecology	Standards generally adequate to protect ORV. However, lack of clarity on wildfire use and suppression in relation to vegetation may allow unintended impacts. Important deer habitat in lower corridor is not optimally managed.	New standards and guidelines to manage trails and recreational would reduce impacts on vegetation and habitat. Clarification of wildfire use and suppression standards helps avoid unintended impacts on vegetation. Programmed monitoring helps detect problem areas.
Cultural History	Standards generally adequate to protect cultural history. Monitoring is informal.	New standards and guidelines for recreation to manage trails and recreational would reduce impacts on historic sites. Programmed monitoring helps detect problem areas.
Recreation	Self discovery experience continues with minimal monitoring or controls. Unmanaged use may lead to more user trails, roads and devegetation. Illegal behaviors continue with occasional monitoring.	New standards and guidelines to manage trails and recreational would reduce impacts on ORV's and other river values while providing for public use and enjoyment. Increasing user education by teaching low impact techniques help reduce effects of recreation. Promotion of volunteer stewardship and increases recreation program sustainability. Programmed monitoring helps detect problem areas.
Commercial and Special Uses	Population increases may lead to more requests for special uses and events that detract from the areas character.	New standards and guidelines to define appropriate special uses to help maintain desired resource conditions and social setting while providing noncommercial and commercial opportunities.

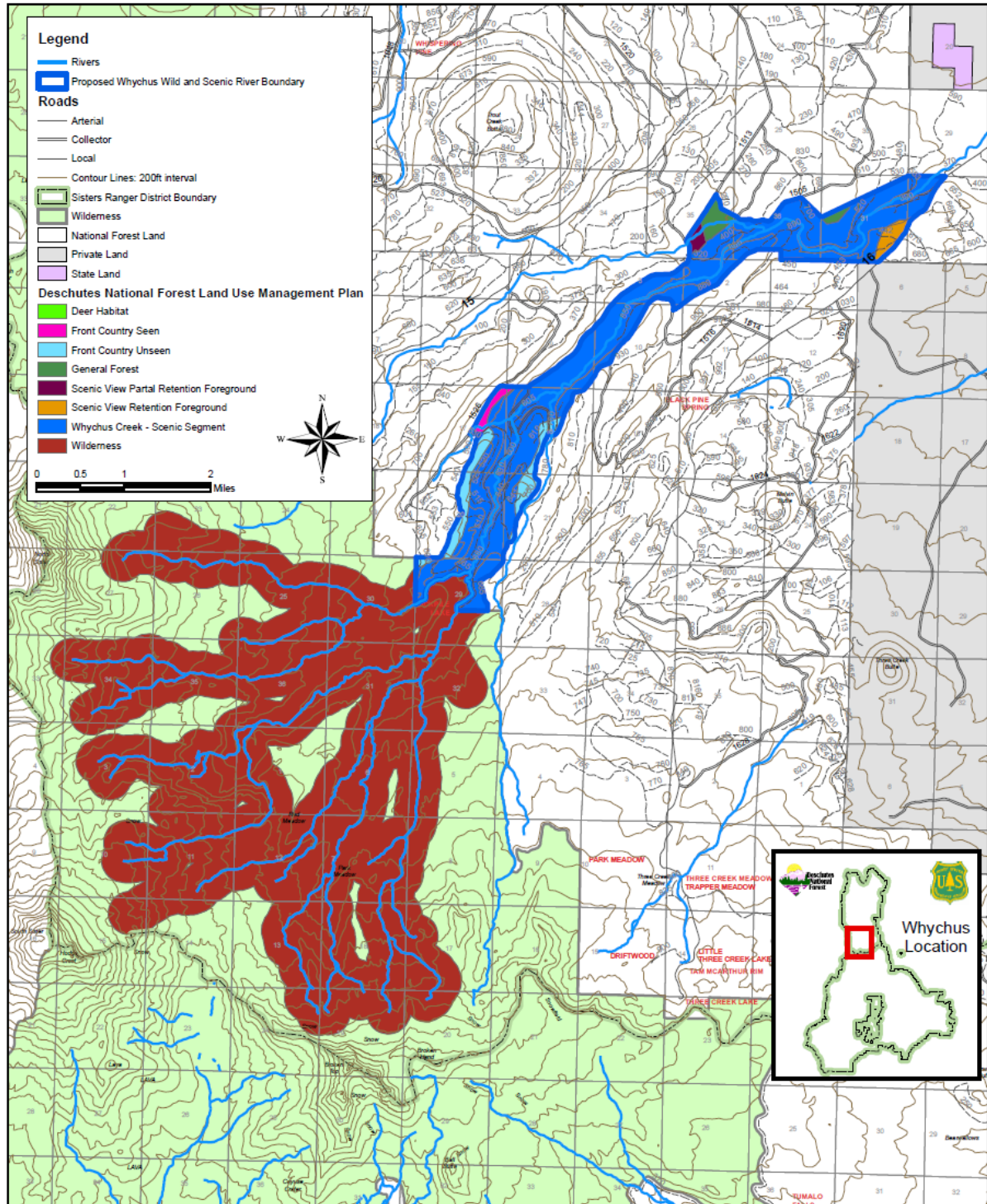


Figure 3. Alternative 2 – Proposed Action- Management Allocation Changes

ENVIRONMENTAL CONSEQUENCES

This section summarizes the physical, biological, and social environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in the chart above. Specialist resource reports are located in the project file.

River Boundary



"Whychus Creek" by John O' Brien

Alternative 1 – No Action

This alternative would continue the Forest Plan direction as it currently exists. The default $\frac{1}{4}$ mile river boundary would be maintained. The allowable 320 acres per mile would be included in the boundary. There would be no change in Deschutes National Forest Management Allocations or Northwest Forest Plan Allocations. In the existing boundary, there are 2,872 acres, 1,644 of those acres are Late Successional Reserve, the rest of the acres are in the Wilderness and managed as "Congressionally Withdrawn" under the Northwest Forest Plan.

Alternative 2 - Proposed Action

The proposed action would modify the river boundary to include hydrologically connected areas, including Pole Creek Swamp, and be more easily located and enforced by using roads, and section lines in the Scenic section. The modified river boundary would include 320 acres per mile in the Wild section and 315 acres per river mile in the Scenic section, both within allowable limits (see Table 5 and Figure 3). Northwest Forest Plan allocations would not change and would overlay the Wild and Scenic River Boundary. However, in the proposed boundary, there are 1,591 acres of Late Successional Reserve and 99 acres of Matrix.

Table 5 - Acres within the Proposed Action River Corridor

River segment- River Miles	Acres/per mile	Total Acres
Wilderness- 41 miles (includes all designated tributaries)	320	13,264
Scenic- 9 miles	315	2,845

A total of 464 acres would change management allocation to Wild and Scenic River (see Table 6 and Figure 3). In the Wilderness the Wild River boundary is set at a default ¼ mile because wilderness standards are more restrictive and the Wilderness allocation would not change.

Table 6 - Acres that will change Management Allocation to Wild and Scenic River under Alternative 2 (Proposed Action)

Management Area	Acres
Deer Habitat	1
Front Country Seen	45
Front Country Unseen	229
General Forest	93
Scenic View Partial Retention Foreground	32
Scenic View Retention Foreground	64
Total Change	464



Geology

Outstandingly Remarkable Value *The geology of Whychus Creek and its wilderness tributaries is an Outstandingly Remarkable Value. No stream of similar size in Central Oregon possesses such a concentration of diverse and varied geologic features. The volcanic and glacial events that created the landscape have national significance.*

Existing Condition

Glacial and volcanic events have created complex, diverse, and highly scenic landscapes within and near the channel of Whychus Creek. The Three Sisters region is noted nationally for its impressively youthful volcanic diversity and scenic landscapes. Whychus Creek and its surrounding landscapes continue to be dynamic and active.

Whychus Creek can be divided into two natural sections - an upper amphitheater section within the Three Sisters Wilderness and a lower channeled section below the Wilderness. The confluence of North Fork of Whychus Creek and Whychus Creek is the natural boundary between the sections.

Within the Three Sisters Wilderness (the upper section) the Whychus Creek drainage lies in a 29-square-mile amphitheater rimmed by four major mountains – the Three Sisters and Broken Top – and by seven glaciers –Bend, Prouty, Carver, Diller, Hayden, Thayer, and Villard. These glaciers are vestiges of the great glaciers of the last ice age. Indeed, the entire amphitheater was completely covered with glaciers at the height of the last ice age 18,000 years ago. The glaciers converged at the present-day confluence of Whychus

Creek and North Fork Whychus Creek. From here a single, thick, two-mile-wide glacier extended four miles to its terminus and to within six miles of present-day Sisters. In the area of the confluence, the glacier eroded away at least 900 vertical feet of volcanic rock. Below the confluence, glacial erosion and water erosion from the melting glacier carved a series of stream channels and ridges. When the glacier receded, the present-day Whychus Creek channel emerged as the deepest, longest and most complex of them all. Above the confluence, several streams converged in palmate fashion to drain the large amphitheater and its mountains.

The glaciers and streams of Whychus Creek and its tributaries have carved their way into a complex set of lavas. Each lava flow reacted differently to attack and erosion by ice and flowing water. Each lava flow had a different size, shape, and range of hardness, and each had its own pattern of fractures and surrounding rubbly material.

The result of this erosion is a remarkably diverse landscape. A partial list of this diversity includes steep and narrow canyons, deep bedrock canyons, numerous waterfalls, a variety of channel shapes and gradients, broad alluvial valleys, abrupt changes in stream direction, clusters of channel-filling giant boulders, water-carved caves, channel beds of polished rock with potholes and flute marks, broad channel beds of platy andesite, fens, springs, and numerous dry tributaries.

Today, Whychus Creek and its channel are unusually dynamic and active. The rugged environment inherited from the last ice age and from the more recent Little Ice Age is highly susceptible to erosion and change by water, wind, ice, frost heave, and wind-thrown trees. Consequently, during high discharge, Whychus Creek produces and transports substantial quantities of gravel, probably more than any other stream of similar size in Central Oregon. Much of this gravel and sediment is now trapped behind the first large irrigation diversion downstream from the Gauging Station. During high flows when the water is not being diverted for irrigation, some of the gravel is transported over the dam and downstream. This gravel production is important because it creates spawning beds for fish in Whychus Creek and the Deschutes River.

Energy Resources - Geothermal

All geothermal leases within the Whychus Creek Wild and Scenic boundary are currently closed. This information was attained through the BLM website LR2000 website (<http://www.blm.gov/lr2000/>) on August 19, 2008 and is attached to this report. The parameters of the search are listed in Table 7. The search contained all of the sections within the Whychus Wild and Scenic boundary and revealed 24 cases that are all currently closed. Of the 24 cases, 23 were casetype 321000 and one was casetype 328200. Casetype 321000 is a non-competitive Geothermal Lease. Casetype 328200 is a Geothermal Unit Agreement.

Table 7 - Geothermal Leases Search in the Whychus Creek Wild and Scenic River area

Type of Report	Area			Run on All Areas		
	Meridian	Township	Range	Geo State	Case Disposition	Case Type
Geographic Report with Customer sorted by Serial Number	33	15S	9E	OR	void	320070 – KGRA
	33	16S	9E		pending	320901 – Geophysical Expl.
	33	17S	9E		rejected	321000 – Geo LSE (non competitive)
	33	15S	10E		withdrawn	322000 – Geo LSE (competitive)
					authorized	325060 – Geo Utilization site
					cancelled	328200 – Geo Unit Agreement
					expired	
					relinquished	
					closed	

Geothermal leasing is excluded on the basis of existing laws and regulations such as the Wilderness Act of 1984 and designated Wild Rivers under the Wild and Scenic River Act. This would exclude the wild portion of the Whychus Creek from geothermal leasing.

The Scenic section of Whychus Creek is protected from impacts of geothermal development by the 1990 Deschutes National Forest Land and Resource Management Plan under Management Area 17 Wild and Scenic Rivers because it only allows geothermal leasing with No Surface Occupancy (NSO). Geothermal Leasing and development could be permitted with conditional use restrictions that protect and enhance the rivers Outstandingly Remarkable Values. Geothermal leases are discretionary in the NSO stipulation and the authorized Forest Service officer can consent to or deny geothermal leases to the Bureau of Land Management on National Forest System Lands. This stipulation can only be modified or eliminated through a separate NEPA review.

Locatable Minerals – Mining Claims

There is low potential of locatable minerals on the Deschutes National Forest because of the young volcanics that comprises most of the forest. However, a mining claim could affect the Geology resource.

No locatable mining claims were found on a search of the BLM website LR2000. The search was similar to the geothermal search above but used all other available case types offered at the time of the search. There are no mining claims on the Sisters Ranger District and only one active mining claim on the Deschutes National Forest.

The Forest is generally open to mineral entry under the 1872 Mining Law. Minerals in a Wilderness are withdrawn from all forms of appropriation under the mining laws and from disposition under all laws pertaining to mineral leasing. This includes the wild section of the Whychus Creek.

The Scenic section of Whychus Creek is subject to regulations from 36 CFR 228. New mining claims are allowed. However, mineral activity must be conducted in a manner that minimizes surface disturbance, sedimentation and pollution, and visual impairment.

Salable Mineral Materials

There is one mineral material source near the Wild and Scenic boundary and it does not affect the Geology resource. Whychus Creek Rock Quarry (Pit Number: 5010) (formerly Squaw Creek Rock Quarry) is a very good hard rock basalt source on the Sisters District. The quarry is located on the south side of Road 1514 (N44° 12.274 W121° 37.552) outside of the ¼-mile corridor of the Wild and Scenic River corridor. This rock source is outside river boundaries and can continue to be used. No new mineral material sources can be developed within the Wild and Scenic boundary. When Whychus Creek Rock Quarry reserves are exhausted, the site would be reclaimed.

Rock Climbing

Rock climbing should be considered dispersed recreation performed on rocks and could affect the Geology resource if rock climbing equipment is installed into rock cliffs along the creek or use increases. If rock climbers were to “leave no trace”, then the Geology resource would not be affected. See discussion on Rock Climbing under “Recreation”.

Environmental Consequences

Alternative 1 - No Action

This alternative would continue the Forest Plan direction as it currently exists. The existing river boundary would be maintained. Rock climbing would continue to be lightly monitored and unregulated. The Geology resource would not be protected under this Alternative from the potential impacts of rock climbing could damage rock features.

Alternative 2 - Proposed Action

The proposed changes to the river boundary would include river related geological features and the new boundary would be easier to enforce. The Geological resource would be better protected and enhanced for future visitors with some controls on rock climbing activities than no action. Increased visual monitoring and partnerships with climbers to educate the climbing community about low impact practices should help reduce disfigurement of exposed rock.

Cumulative Effects

Past management which has affected geological resources in the cumulative effects analysis area (the Whychus Watershed) over the past 100 years includes: mining (removing river gravel) and unmanaged recreation. These actions have caused damage to geological resources by removing rock and gravel or defacing rock with graffiti, climbing chalk or hardware.



Natural arch in volcanic breccia

There are no recent Forest Service activities within the cumulative effects analysis area that have affected geological resources and no foreseeable future actions in the next 5 years except this plan. Increased management controls on rock climbing would protect rock faces and improve protection as use in the area grows.

Hydrology



Outstandingly Remarkable Value *Whychus Creek and its Wilderness tributaries possess Outstandingly Remarkable Hydrological Values. The precipitation gradient is one of the steepest in the region. Complex channel morphology created by glacial erosion through diverse geological features has created a variety of water-carved features such as waterfalls, caves and potholes. Wetlands within the Wild and Scenic River boundary are considered significant and contribute to the river's character. The high elevation moraine-dam lakes such as Carver Lake are remnants of the Little Ice Age and have national significance. The Carver Lake moraine dam has a risk of failing (less than 1% chance) and which could result in flooding in Sisters. The water quality of Whychus Creek is good but not Outstandingly Remarkable.*

Existing Condition

The Whychus Wild and Scenic River Plan Project area begins just upstream of the Oregon Department of Water Resources stream gauge near Sisters (#14075000). The project area is approximately 1/8 mile wide on each side of Whychus Creek up to the Wilderness boundary.

The Whychus Wild and Scenic River Plan boundary is located in portions of the Headwaters of Whychus Creek and the Upper Whychus Creek subwatersheds. The hydrology analysis area included these two subwatersheds. However, all the subwatersheds (6th fields) that drain directly into Whychus Creek were analyzed for cumulative effects, which includes: Headwaters of Whychus Creek, Upper Whychus Creek, Middle Whychus Creek, and Lower Whychus Creek. The existing condition and environmental effects for the hydrology analysis area are described in this document. In

addition, the Whychus Creek watershed was analyzed in the Sisters/Whychus Watershed Analysis (U.S. Forest Service 1998b) and the Whychus Watershed Analysis Update (Press 2009, Dachtler 2009).

Precipitation

The precipitation gradient in the Wild and Scenic corridor, as well as the surrounding subwatershed, is dramatic and ranges from 110 in/yr in the headwaters (primarily as snow above 5,000 ft) to approximately 15 in/yr near the Oregon Water Resources Department gauging station, a straight-line distance of approximately 12 miles. Precipitation gradients along the east side of the Cascade Mountains are generally steep but usually only show a difference of less than 80 in/yr over the same distance. The Whychus watershed precipitation gradient is the steepest in eastern Oregon and one of the two steepest in the Pacific Northwest Eastern Cascades Region (i.e. eastern Oregon and Washington).

Only eleven percent of the precipitation that falls within the Whychus Creek subwatershed flows as surface water in Whychus Creek and its tributaries. The remaining precipitation is evaporated or infiltrated and flows through highly porous lava flows and volcanic ash until it is discharged into the Deschutes River as springs.

Streamflow

The headwaters of Whychus Creek originate in the Three Sisters Wilderness below glaciers on the Three Sisters and Broken Top and high mountain lakes. Whychus Creek, is a perennial stream that enters the Deschutes River near river mile 123. The headwaters of Whychus Creek consist of numerous perennial streams (Soap Creek, North Fork Whychus Creek, South Fork Whychus Creek, Park Creek, East Fork Park Creek, and West Fork Park Creek) that mostly converge into Whychus Creek approximately 3 miles below the wilderness boundary. Another tributary, Pole Creek, converges with Whychus Creek via Pole Creek Swamp approximately 3 miles upstream of the Whychus Creek stream gauge (#14075000). Very little Pole Creek water reaches Whychus Creek in the summer due to diversions and water storage in the swamp (Press 2009). Also upstream approximately 3 miles of the Whychus Creek stream gauge (#14075000) an unnamed intermittent tributary enters Whychus Creek on the river right side, opposite of Pole Creek and slightly downstream. Only the lower reaches of the intermittent tributary and Pole Creek, including Pole Creek Swamp, would be included the Whychus Wild and Scenic River boundary.

Whychus Creek is the largest glacial-fed stream that maintains surface flow in the Deschutes Basin. Most other stream flow regimes in the Whychus watershed are spring-fed or a combination of spring-fed and snow-melt.

Whychus Creek is the only stream in the Deschutes Basin with a flashy, snow melt dominant flow regime that has a long-term (100 years) flow record. The Whychus Creek gauge near Sisters, Oregon (#14075000), at the lower end of the Wild and Scenic River boundary, has been in operation since 1906. This long-term record provides important long term baseline data used by scientists and agencies to better understand and manage

river systems. Analysis of the stream gauge record shows that large, short duration rain-on-snow events occur during winter months and lower magnitude, more sustained elevated flows resulting from upland snowmelt occur during the spring months. As a result of these two types of high flow events, the typical hydrograph for Whychus Creek is bimodal and flashy. A large portion of Whychus Creek above the gauge, except for the area within the wilderness boundary, is within the rain-on-snow zone (approximately, 3500 to 5000 ft). As a result, most of the big peak flows are attributed to rain-on-snow events.

Estimated bankfull flow, which is similar to the flow associated with the spring-melt season peak flows, was calculated using standard USGS methodologies and is estimated to be 429 cubic/feet/second (cfs) at a 1.5 year recurrence interval above the Three Sisters Irrigation District diversion and 317 cfs below the diversion (Flynn et al. 2006). The highest flow in the 102 year record is 2000 cfs, which occurred on December 25, 1980, during a rain-on-snow event. In the last 10 years, 6 of the top 11 peak flows on record have occurred, two of which occurred in November 2006 and 2007 (both approximately 1200 cfs). It appears that rain-on-snow events, resulting in high streamflows, are becoming more frequent in the Whychus Creek watershed and may be a result of climate change and/or changing weather patterns.

Above the Three Sisters Irrigation District diversion and within the Whychus Creek Wild and Scenic River Plan boundary, Whychus Creek is free-flowing. It is mostly higher gradient and confined within a canyon (Rosgen A and B stream types; Rosgen 1996). It is predominately a transport reach with minimal depositional areas. Below the Whychus stream gauge (#14075000) and the Wild and Scenic River boundary Whychus Creek flows over an alluvial fan, which historically, created large depositional areas and multiple channels. Much of the stream downstream of the Three Sisters Irrigation District diversion dam, located approximately 1.5 miles downstream of the Whychus Creek stream gauge (#14075000), was straightened and bermed prior to 1970 for flood control, agriculture, and development. Now, high flows are mostly contained within a single-thread channel and the former floodplain is now a terrace for most of Whychus Creek downstream of the Three Sisters Irrigation District dam.

The Three Sisters Irrigation District diversion, has significantly affected the natural hydrograph resulting in a much decreased summer base flow and a reduced spring snowmelt (bankfull) runoff. On average the Three Sisters Irrigation District diverts approximately 150 cfs between April and September. The diversion has reduced the longer-duration, spring snowmelt flows, by 37% but has had little influence on the highest and flashiest instantaneous peak flows, which are often associated with rain-on-snow events. There are eight water right claims on Whychus Creek between gauge #14075000 and the town of Sisters, and six claims with the highest priority (including the Three Sisters Irrigation District diversion) use to dewater the stream between Sisters and Camp Polk during the summer low flow period (U. S. Forest Service 1998b). Since then, water conservation efforts have been implemented such as improving the efficiency of diversions, transferring water rights, and leasing water rights with the goal of increasing low flow to at least 20 cfs. In the summer of 2008, stream flow was 16 cfs in Sisters, OR.

Downstream of the Three Sisters Irrigation District dam, base flow is generally warm and shallow because width-to-depth ratios are high and no low flow channel has developed.

Although, the flow regime in Whychus Creek is dominated by snow/glacial melt, there are wetlands that contribute to the stream flow. Perennial springs and wetlands that supply a significant portion of the stream flow are not unique to the Deschutes Basin; however, they are unique at a regional scale. Numerous year-round springs supply cool water during the summer low flow to Whychus Creek. Some of these springs contribute water to Whychus Creek Meadow, a properly functioning five acre wetland with abundant rushes and sedges and small rivulets. This area is important for ground water recharge and for storing water for late summer stream flows. Historically, Pole Creek Swamp was another wetland providing important late season stream flows. Presently, some of the water from Pole Creek, which formerly supplied the wetland, is diverted for irrigation use. This reduces the late-season flow release from Pole Creek Swamp.

Carver Lake

Many new lakes appeared in the Three Sisters area during the 1920s to 1940s during the period of greatest glacial retreat in the Central Oregon Cascade Range. Glaciers formed during the Little Ice Age advanced into the mid 1800s, then retreated, leaving basins behind abandoned terminal moraines. The basins filled with water to form moraine-dammed lakes. It is reported that the highest concentration of past and present Neoglacial moraine-dammed lakes in the conterminous United States is in the Central Oregon Cascade Range (O'Connor et al. 2001). Several of these Neo-glacial lakes lie within the Whychus Creek drainage amphitheater.

These pristine, high-elevation lakes in the headwaters of Whychus Creek, including Carver Lake and Chambers Lake, store cool water used for late season stream flow into the wilderness tributaries of Whychus Creek. In mid -August of 2009, discharge from the mouth of Carver Lake into the Whychus Creek drainage was measured at 11 cfs (Barton Wills Personal Communication).

Carver Lake, a moraine-dam lake formed after 1930, is at the headwaters of North Fork Falls Creek, a headwater tributary to Whychus Creek. A 1987 and 1992 USGS report discussed the risk of a moraine dam failure resulting in a breach of Carver Lake which could result in a debris flow in the headwaters and a sediment laden high flow through Sisters, Oregon. (Laenen et al. 1987, 1992).

A similar type event occurred in 1970 when a moraine dam lake at the base of Diller Glacier failed and sent a surge of debris and water 5 miles down the North Fork of Whychus Creek. This lake was a 1/3 of the size of Carver Lake and resulted in a sediment-laden flow of 1240 cfs at the upper gauge (#14075000).

The risk was further discussed in a recent meeting with the USGS and the City of Sisters on January 14, 2009. The USGS explained that while examining the assumptions in the debris flow model used in the 1987 study in relation to worldwide examples from the 2001 USGS study, it appears that the starting conditions of 1987 model are extreme and rare. They believe the “least extreme” scenario in the 1987 study would be the most realistic flow levels. The “least extreme” scenario estimated 10,500 cfs would arrive at the upper gauging station (#14075000) in 2.7 hours and 3,700 cfs would arrive in Sisters shortly thereafter. The probability of Carver Lake breaching is unknown but is believed to be less than the 1 – 5% stated in the 1987 USGS report because most breaches occur within the first two decades after the lake was formed (U.S. Forest Service 2009). Risk of yearly winter floods from rain-on-snow appears to be increasing and is higher risk than Carver Lake dam failure (see Streamflow).



Carver Lake Warning Sign near Road 1514 Bridge

Channel Morphology- In the Wild and Scenic River Corridor

The diverse geology and glacial origins of Whychus Creek and its tributaries have created a complex array of water-created features as ice and water flows carved their way through different lavas. Throughout the steep reach through the Wild and Scenic section there are numerous waterfalls, cascades, and bedrock chutes that show the dynamic and powerful nature of Whychus Creek. The variety of these features is unique in the region.



Chush Falls

Two of the most impressive waterfalls are Chush Falls and Upper Chush Falls. Many of these waterfalls, cascades, and chutes run over smooth bedrock. Some cascades flow over speckled andesite bedrock, which was probably exposed during an event triggered from a moraine lake failure. In other areas, black basalt is sculpted by the river in narrow bedrock chutes. In addition, there is abundant large woody debris and many large debris

jams that are constantly changing the

location and size of waterfalls and cascades.

Although, Whychus Creek is very dynamic with flashy stream flows and a large bedload, there is very little bank erosion in the Wild and Scenic corridor. Intact riparian vegetation, a properly functioning floodplain, and uninhibited streamflows attribute to the stability of the stream banks and bed.

Wychus Creek channel condition is distinctly different above the Three Sisters Irrigation District diversion than below the diversion. Above the diversion, mostly in the Whychus Wild and Scenic River boundary, there have been fewer human impacts to Whychus Creek because it is mostly confined by a bedrock canyon and/or it flows through wilderness. Reaches in the Wild and Scenic reach are steeper, mostly Rosgen A (steep, straight, confined) and B reaches (moderate gradient, straight, confined), with bedrock and large cobble or small boulder substrate (Rosgen 1996). Banks are generally well vegetated; however, there is evidence of high flow deposits and high flow channels. There are a few short Rosgen C (low gradient, sinuous, not entrenched) and D (low gradient, braided, not entrenched) reaches above the diversion and all have evidence of high flow or relic channels in the floodplain.

Channel Morphology- Below the Wild and Scenic River Corridor

Downstream of the Three Sisters Irrigation District dam and the Whychus Wild and Scenic boundary, there is substantial channel instability. Near the dam the topography changes and the valley becomes a wide, low gradient, unconfined, alluvial fan. The fan extends through the town of Sisters to the canyon just downstream of Camp Polk Meadow Preserve. Although there is a dam at the Three Sisters Irrigation District diversion, the sediment supply is not significantly affected by the diversion, as determined by a study in 2002 (Inter-Fluve 2002). Historically, as depicted from aerial photos and relic flood channels, Whychus Creek meandered across this entire valley. This area was a depositional area, with access to a well developed floodplain and abundant riparian vegetation.

Due to development, flood control, and agriculture, sections of Whychus Creek below the Wild and Scenic River boundary are now mostly confined to one channel and it has been straightened through much of the alluvial fan reach. Now it functions as a sediment transport reach with little or no access to its floodplain. As a result, excess sediment is deposited in the few reaches that still maintain floodplain connectivity, which often produces lateral migration.

Disconnection from the floodplain has resulted in a narrow riparian area that lines the streambanks. Due to high bank erosion riparian vegetation is being scoured and not replaced. As a result, future large wood recruitment is reduced. Instream large woody debris ranges from 11 to 20 pieces per mile between Sisters and the upper stream gauge (#14075000) and between 31 and 48 pieces per mile above the stream gauge. Although large woody debris ranges are generally above the INFISH standard of 20 pieces over 12" diameter at breast height (dbh) per mile, they are still below historic levels. The loss of large cottonwood galleries from stream incision and low base flows has reduced instream

large woody debris near the town of Sisters (USFS 1998b). Likewise, instream wood was removed for maintenance of irrigation diversion structures after the 1964 flood. Historic densities of large woody debris were probably closer to the densities found upstream of the stream gauge. Large woody debris densities upstream of the stream gauge are similar to the large woody debris average density in the John Day and Malheur unaltered C stream type reaches which are 48 pieces over 12" dbh per mile (Cordova 1995).

Downstream of the Three Sisters Irrigation District Dam, Whychus Creek is unstable and is either incised, braiding or both. As a result, there is a substantial fine sediment contribution to the stream from eroding banks. Floodplain connectivity is highly lacking and the sediment regime is out of balance mostly due to past berm construction and removal of large wood resulting in the channel downcutting. Also, there are numerous irrigation diversions, two of which poses a fish passage barrier.

Downstream of the Whychus Wild and Scenic River corridor area there are various restoration efforts occurring within the watershed to improve fish habitat conditions in Whychus Creek. The Upper Deschutes Watershed Council is working with irrigators to provide fish passage and to screen diversions. They are also working with the City of Sisters to create a Restoration Management Plan for the creek as it flows through Sisters. The restoration efforts would use bio-engineering techniques to protect structures and it would include management direction for creating floodplain in areas where structures have been lost.

Approximately 4 miles downstream of the City of Sisters Whychus Creek flows through Camp Polk Meadow Preserve, a property owned by the Deschutes Basin Land Trust. Prior to 1943 Whychus Creek was pushed to the side of the valley and straightened resulting in an incised, over-widened, channel with very little fish habitat. This property is currently being restored through a partnership with the Forest Service, Upper Deschutes Watershed Council, and the Deschutes Land Trust. Approximately 1.7 miles of stream channel will be remeandered through the meadow creating abundant fish habitat, increasing wetlands, and reducing stream temperatures. Implementation will occur in two phases and it began in May 2009 with an anticipated completion date of 2011. A similar type project is also being planned for another private meadow property approximately 9 miles downstream of the City of Sisters at Rimrock Ranch.

Water Quality

The Whychus Watershed Analysis (USFS 1998b) and the Whychus Watershed Analysis Update (Press 2009) discuss how the State designated beneficial uses of the Deschutes Basin apply to waterbodies in the Whychus analysis area. Water quality parameters associated with beneficial uses for waterbodies in the Whychus Wild and Scenic River Plan Project analysis area that have been altered from historic conditions are flow, temperature, dissolved oxygen, and sediment.

303(d) Listed Streams

The State of Oregon is required by the Clean Water Act, Section 303(d), to identify waters that do not meet water quality standards. Whychus Creek, throughout its length, is listed on the Oregon 2004/2006 303(d) list for water quality exceeding the State standard established in 2004. Lower Whychus Creek outside the Wild and Scenic River Corridor has exceeded the 7-day average maximum water temperature standard for salmon and trout rearing and migration which is 18° C (ODEQ 2007).

Although stream temperatures are not above the State standard along the entire length, Whychus Creek is still listed as impaired its entire length because the listing criteria is based on beneficial uses.

Table 8. Beneficial uses within the Whychus Wild and Scenic River area

Beneficial Use	Water Quality Parameter
Public and Private Domestic Water Supply	Turbidity, Flow
Irrigation	Flow
Livestock Watering	Flow
Fish and Aquatic Life	Dissolved Oxygen, Sedimentation, Temperature, Flow
Wildlife and Hunting	Flow
Fishing	Temperature
Water Contact Recreation	Dissolved Oxygen
Aesthetic Quality	Turbidity

Steelhead trout were reintroduced in Whychus Creek in 2007 and efforts are ongoing; however, a state standard for steelhead spawning in Whychus Creek has not yet been set. Therefore, a potential state standard was evaluated by the Upper Deschutes Watershed Council based on the state standard set for the Lower Deschutes River (Hill et al. 2008). Lower Whychus Creek water temperatures also do not meet the potential state temperature standard for salmon and steelhead spawning (January 1 through May 15, temperatures not to exceed 13 °C) (Hill et al. 2008).

States are required to develop Total Maximum Daily Load allocations, which include Water Quality Management Plans for 303(d) listed waters. The Upper Deschutes River Subbasin Total Maximum Daily Load and Water Quality Management Plans are being planned and cover all the subwatersheds in the Whychus Wild and Scenic River Plan Project boundary. A Memorandum of Understanding signed May 2002, between Oregon Department of Environmental Quality and the U. S. Forest Service, designated the Forest Service as the management agency for the State on National Forest Service lands. To meet Clean Water Act responsibilities defined in the Memorandum of Understanding, the Forest Service is responsible for developing a Water Quality Restoration Plan, which is now in draft form (USFS 2004). Activities proposed in the Whychus Wild and Scenic River Plan Project area are in compliance with the draft Water Quality Restoration Plan.

Temperature

The Whychus Watershed Analysis (USFS 1998b) and the Whychus Watershed Analysis Update (Press 2009) analyzed stream temperature data on Whychus Creek. Temperature monitoring has continued in Whychus Creek, but 7-day maximum averages have only been calculated through 2005.

Water temperature within the Whychus Wild and Scenic River boundary is consistently below the State water temperature standard and contributes to the exceptional water quality in this reach. Stream temperatures in Whychus Creek get progressively warmer as water moves downstream from Rd 1514 to the City Park in Sisters (Table 9). Water temperature in Whychus Creek below Rd 16, outside the Wild and Scenic River corridor has been consistently above the State Water Quality standard for salmon and trout rearing and migration. Cold water springs 1.6 miles from the mouth of Whychus Creek lower water temperature in Whychus Creek below the 2004 temperature standard. Temperature monitoring by the Upper Deschutes Watershed Council from 2005 - 2008 also show that temperatures outside the Wild and Scenic River boundary in Whychus Creek do not meet the potential state standard to protect steelhead spawning for nearly 25 miles from Sisters to the Deschutes River (Hill et al. 2008).

Insufficient in-stream flows are the main reason for high water temperatures in Whychus Creek. Reduced base flows increase the amount of time water is exposed to solar radiation and reduces the amount of water available for riparian vegetation. The lack of sufficient riparian vegetation also exacerbates channel erosion and widening, leading warmer stream temperatures from increased surface area. Below the Three Sisters Irrigation District diversion low flow is significantly reduced as is riparian vegetation. Average low flow above the diversion in August is 92 cfs and, due to water conservation efforts, low flow below the diversion has been increased from 1 cfs to 15-20 cfs. Target flows for Whychus Creek, based on Oregon Department of Fish and Wildlife instream water rights, is 20 cfs upstream of Indian Ford Creek and 33 cfs downstream of Indian Ford Creek.

Table 9. Water temperature monitoring in the Whychus Watershed Analysis Area (sites on the same stream listed from upstream to downstream).

Stream	Period of record	Max 7-day ave. max. temperature	2003 Water Temperature standard
Whychus Ck @ Rd 1514	1997-1999, 2002, 2006	14.4° C	18° C
Whychus Ck @ Gauging station #14075000	1991, 1994-2000, 2002-2006	16.3° C	18° C
Whychus Ck @ Rd 4606 foot bridge	1999 - 2005	20.4° C	18° C
Whychus Ck @ City Park	1997-2006	24.4° C	18° C

* one time recording

**estimate

Dissolved Oxygen

Dissolved oxygen is directly related to water temperature and biological activity and was analyzed in the Sisters/Whychus Watershed Analysis (USFS 1998b). Whychus Creek has reached dissolved oxygen levels as low as 8.8 mg/L and 94% saturation in summer low flow months downstream of the Whychus Wild and Scenic River boundary. Although dissolved oxygen in the stream has not been measured according to the State protocol, it could be below State standards downstream of the Wild and Scenic River boundary (USFS 1998b).

Sedimentation Within and Below the Wild and Scenic River Corridor

The amount of fine sediment transported to or eroded within a stream channel can affect the beneficial uses of water, and is frequently used as a measure of overall water quality. Oregon administrative rules addresses sediment through a turbidity standard that states, “No more than 10 percent cumulative increases in natural streams turbidities shall be allowed, as measured relative to a control point immediately upstream of the turbidity-causing activity” (OAR 340-041-0336; ODEQ 2003). For this report, sedimentation, including turbidity and fine sediment in substrate, will be analyzed because of the effects on channel morphology and aquatic species. The Sisters Ranger District has monitored Whychus Creek for turbidity, percent fine sediment in spawning gravels, gravel embeddness (the degree to which fine sediments surround gravel pieces on the surface of a streambed), and bank stability, all of which are parameters associated with fine sediment.

The Sisters/Whychus Watershed Analysis analyzed sediment in Whychus Creek (USFS 1998b). Within the Wild and Scenic River boundary bank erosion is minimal and limited to areas of natural channel migration and to short sections where trail erosion is affecting the streambanks. As a result, fine sediment in the Wild and Scenic boundary was nearly half the amounts found near Sisters. Generally, turbidity in this reach is low with short events of natural high turbidity from glacial runoff in the late summer. Aquatic macroinvertebrate sampling results for Whychus Creek collected near the gaging station during 1989-1999 (Lovtang and Riehle 2000) showed the macroinvertebrate community was not very diverse but had a good representation of water quality sensitive taxa.

Downstream of the Wild and Scenic boundary, the percent of the substrate that is fine sediment is thought to be high due to extensive bank erosion. In 1997, up to 13% of the streambanks within the channelized reaches of Whychus Creek below the Wild and Scenic River corridor were unstable. This value may be higher now due to recent high flow events. At a depositional area on the Camp Polk property, up to 13 feet of erosion was observed during three flood events in the fall of 2007 (Senkier per. comm. 2009). These highly eroding banks can lead to spikes in turbidity levels during high flow events; however, turbidity levels quickly dissipate as flows decrease. Turbidity levels in Whychus Creek on public lands are mostly only 1-2 Formazin Turbidity Unit or Jackson Turbidity Unit.

Despite high fine sediment contribution, gravel embeddedness was not found to be high in Whychus Creek during the 1990 stream survey. However, streambed substrate was sampled using pebble count methods during the 1997 stream survey and fine sediment was higher in the reach downstream of the Wild and Scenic River boundary between Sisters and the Three Sisters Irrigation District diversion, which could cause some gravel embeddedness (Dachtler 2009). Aquatic macroinvertebrate sampling results showed that clean water taxa richness was reduced at the Rd 4606, which is likely a reflection of high water temperatures and fine sediment (Lovtang and Riehle 2000).

Sedimentation from Roads, Trails, and Dispersed Camping

Roads and trails adjacent to or that cross Whychus Creek contribute some sediment as do revegetated and compacted dispersed camping areas. Within the Whychus Wild and Scenic boundary these situations exist but they are less prevalent than downstream near the City of Sisters because of the steeper terrain in the Wild and Scenic River area.

The close proximity of Whychus Creek to Sisters and the lack of developed campgrounds has contributed to the creation of user created dispersed campsites along with user created roads, fords and trails. Over time the impacts of this focused recreational use has impaired sensitive streamside riparian habitat function. This concentrated use has contributed to compacted streamside soils, increased sedimentation and runoff to streams, and increased the loss of streamside vegetation. Stream crossing and “creek crawling” with vehicles also occurs and can lead directly to stream pollution, bank sloughing, destruction of trout and salmon habitat, and the spread of invasive plants to downstream areas.

In addition, system roads that were closed by past administrative decisions were never physically closed or made hydrologically stable (i.e. removed culverts, installed drainage) because they might be used in the future and some closures have been breached. The continued use of these unmaintained Forest Service roads keeps them from revegetating and perpetuates any erosion or sediment runoff problems. User created roads and trails have similar problems because they were not designed with proper drainage features to withstand precipitation and runoff.

The Forest Service has recently made efforts to reduce some of the sedimentation and riparian plant effects from roads and dispersed camping (Press 2009). The Whychus Creek Riparian Protection Project (2005-2007) reduced user created roads and fords that go through Whychus Creek, side channels and floodplains from the town of Sisters up to North Fork Whychus Creek near the Three Sisters Wilderness boundary. Boulders were placed to restrict off road vehicle use and prevent vehicles from driving in the stream. Some dispersed camping areas were closed or pulled back from the edge of Whychus Creek. The intent was to provide a limited number of quality dispersed camping opportunities that would protect important fish and riparian habitat along Whychus Creek. A total of 59 sites were protected which resulted in the closure of 1.1 miles of system roads and the closure of an unknown amount of user created roads and trails.

In July 2009, the 59 protected sites on Whychus Creek were surveyed to see if they had been damaged or breached and if there were other sites that were overlooked or had become heavily used recently (Dachtler 2009). The sites were split into lower, middle and upper reaches (Wild and Scenic reach): Mainline footbridge (just above Sisters) to lower end of private land, upper end of private land to the gaging station, and the Wild and Scenic reach from the gaging station to North Fork Whychus Creek. Nine sites or 15 % of the sites were breached with four of the sites breached in the lowest reach which is closest to the town of Sisters. Three sites were breached in the middle reach and two in the upper reach (Wild and Scenic reach). Seven of the breached sites were at campsites and a single boulder was moved to create vehicle access to a campsite closer to the stream. At the two other breached sites vehicles had driven cross country around boulders to access closed system roads. Sites were restored, however since July, 3, 2009, more sites have been damaged or breached by vehicles or off road vehicles.

Environmental Consequences

Alternative 1 - No Action

Using the existing Federal and State guidelines, such as those in the Northwest Forest Plan, Aquatic Conservation Strategy, INFISH, State water quality standards, and the Deschutes Land and Resource Management Plan, would be adequate to protect the hydrology resource within the Whychus Wild and Scenic River boundary. However, unfocused management and minimal monitoring are not moving conditions toward the desired condition.

Activities associated with dispersed recreation (e.g., user created roads and trails, sprawl of dispersed campsites, etc.) are expanding along Whychus Creek, including within the Wild and Scenic River boundary. These activities are either directly or indirectly (e.g., trampling banks or removing streamside vegetation thus making the banks more susceptible to erosion) inputting sediment into these streams. Continued or increased unregulated use in these areas could result in unacceptable resource damage. In addition, unregulated boating may lead to unauthorized manipulation of instream wood that creates channel complexity and stability.

The generic 1/4 mile buffer around Whychus Creek upstream of gauge #14075000 is arbitrary and difficult to identify in the field making project implementation and enforcement of the Wild and Scenic River standards and guidelines more difficult. However, there would be no negative effects to stream temperature and the 303(d) list status of Whychus Creek. Likewise, Aquatic Conservation Strategy Objectives under the Northwest Forest Plan and Riparian Management Objectives under INFISH would continue to be implemented under existing Forest Plan direction. Even with the direction in the Forest Plan, there is more of a risk to the water resource under Alternative 1 because of the lack of clarity, monitoring, regulation, and enforcement.

Alternative 2 - Proposed Action

Existing guidelines in Federal and State guidelines such as the Northwest Forest Plan, Aquatic Conservation Strategy, INFISH, State water quality standards, and the Deschutes Land and Resource Management Plan are generally adequate to protect the hydrology resource. However, to improve clarity, management, and enforcement several new standards and guidelines for the Whychus Wild and Scenic River boundary are proposed in Alternative 2. New recreation standards would help meet the goal of reducing erosion by consolidating user-created trails into a managed trail system, relocating trails, closing user roads and trails, and by limiting access to most trails by the river to foot traffic. Reducing trail erosion near Whychus Creek and other hydrologically connected areas could reduce bank instability and sedimentation to Whychus Creek. A new standard to prevent instream wood manipulation by boaters would help protect stream channel stability.

Under Alternative 2, dispersed recreation would be monitored under a specific plan and regulated where necessary. Limits of Acceptable Change would be developed for dispersed sites so it is easier to determine if unacceptable resource damage is occurring and what remedial action(s) (including closure and rehabilitation) would need to occur. This alternative would rehabilitate current sites that are contributing sediment and better manage/monitor future sites so as to limit sediment concerns. Likewise, instream wood would be monitored to determine if additional protective measures are needed.

Under Alternative 2, the Whychus Wild and Scenic boundary would be modified to use topographic features and roads to define the boundary while including hydrologically connected areas. Defining the boundary based on real on-the-ground features would make project implementation and enforcement of the Wild and Scenic Plan standards and guidelines easier. Likewise, the inclusion of hydrologically connected areas would provide greater protection for Whychus Creek.

There would be no negative effects but potentially a positive long term effect to stream temperature and the 303(d) list status of Whychus Creek through the adoption of the Whychus Creek Wild and Scenic River Management Plan. Added recreational standards and guidelines under Alternative 2 could help reduce user impacts in the riparian areas, thereby providing better riparian vegetation for stream shade. Aquatic Conservation Strategy Objectives under the Northwest Forest Plan and Riparian Management Objectives under INFISH would continue to be managed for under the Whychus Wild and Scenic River Management Plan and added recreation standards and guidelines would help towards the attainment of these Objectives; therefore, Alternative 2 would be consistent with the Aquatic Conservation Strategy objectives.

Cumulative Effects

The hydrology cumulative effects analysis area includes all subwatersheds (6th fields) that drain directly into Whychus Creek: Headwaters of Whychus Creek, Upper Whychus Creek, Middle Whychus Creek, and Lower Whychus Creek. Effects to the hydrology resource from the action alternative in the Whychus Wild and Scenic River Plan EA would incrementally add to cumulative effects because of the beneficial effects predicted

by the added standards and guidelines and the new boundary. The added protection to water quality and instream wood from the Wild and Scenic River Plan would combine with the positive effects from the on-going restoration efforts in the Whychus watershed. No negative effects from the action alternative are predicted; therefore, the Wild and Scenic River Plan would not incrementally add to any negative cumulative effects.

Consistency with Northwest Forest Plan/ Riparian Reserve Requirements

The Whychus Creek Wild and Scenic River Plan complies with the following four requirements for projects within Riparian Reserves as directed in the Record of Decision in the Northwest Forest Plan (USFS and BLM 1994):

1. "Review projects against the Aquatic Conservation Strategy objectives at the project or site scale, rather than only at the watershed scale....,
2. Evaluate the immediate (short-term) impacts, as well as long-term impacts of an action,
3. Provide a description of the existing condition, including the importation physical and biological components of the 5th field watershed; and
4. Provide written evidence that the decision maker considered relevant findings of watershed analysis" (USFS and BLM 2007).

The Whychus Creek Wild and Scenic River Plan meets the four requirements by:

1. Providing an analysis of the Aquatic Conservation Strategy objectives in the Environmental Assessment,
2. Discussing the effect of the proposed Whychus Wild and Scenic River Management Plan and other past, present and future foreseeable projects on the existing condition in the hydrology report,
3. Referencing the Sisters/Whychus Watershed Analysis (1998), and the Whychus Watershed Analysis Update (Press 2009) which describe the existing condition for the portion of Whychus 5th field watershed on the Sisters Ranger District; and
4. By providing a Decision Notice written by the District Ranger demonstrating the use of the Sisters/Whychus Watershed Analysis and Update for the preferred alternative.

Both alternatives in the Whychus Creek Wild and Scenic River Plan Environmental Assessment comply with the Riparian Reserve and Key Watershed standards and guidelines in the Northwest Forest Plan and are consistent with the Aquatic Conservation Strategy.

Consistency with Aquatic Conservation Strategy Objectives

Based on the evaluation of the short-term, long-term, and cumulative impacts, the Proposed Action for the Whychus Wild and Scenic River Plan is consistent with Aquatic Conservation Strategy objectives. Each Aquatic Conservation Strategy Objective is discussed below (USFS and BLM 1994):

1. **Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species populations and communities are uniquely adapted.**

The Whychus Creek Wild and Scenic River Plan is a programmatic decision and is not associated with ground disturbing activities. Proposed new standards and guidelines in the Plan associated with recreation would help restore the distribution, diversity, and complexity of watershed and landscape-scale features by reducing watershed impacts from trails. By consolidating user-created trails and managing a system trail network landscape erosion would be reduced. Under the proposed action, dispersed recreational use would be better monitored and Limits of Acceptable Change would be developed for these sites so that it would be easier to determine if unacceptable resource damage is occurring and what remedial action(s) (including closure and rehabilitation) would need to occur.

2. **Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.**

The Whychus Creek Wild and Scenic River Plan is a programmatic decision and is not associated with ground disturbing activities. Proposed new standards and guidelines in the Plan associated with recreation would help restore the spatial and temporal connectivity within watersheds by consolidating dispersed use in the Wild and Scenic corridor. Under the proposed action, dispersed recreational use would be better monitored and Limits of Acceptable Change would be developed for these sites so that it would be easier to determine if unacceptable resource damage is occurring and what remedial action(s) (including closure and rehabilitation) would need to occur.

3. **Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.**

The Whychus Creek Wild and Scenic River Plan is a programmatic decision and is not associated with ground disturbing activities. Proposed new standards and guidelines in the Plan associated with recreation would help restore the physical integrity of the aquatic system by reducing trails adjacent to Whychus Creek. Proposed new standards and guidelines would limit trails to one side of Whychus Creek, consolidate user-trails into one defined system river trail that could be

managed, and limit access on most river trails to foot traffic. A new standard to prevent instream wood manipulation by boaters would help protect stream channel stability. Under the proposed action, dispersed recreational use and instream wood would be better monitored and Limits of Acceptable Change would be developed for these sites so that it would be easier to determine if unacceptable resource damage is occurring and what remedial action(s) (including closure and rehabilitation) would need to occur.

- 4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the streams and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.**

The Whychus Creek Wild and Scenic River Plan is a programmatic decision and is not associated with ground disturbing activities. Proposed new standards and guidelines in the Plan associated with recreation would help restore water quality by reducing sedimentation from trails by reducing user-created trails and managing a system trail network. A new standard to prevent instream wood manipulation by boaters would help protect stream channel stability and habitat. Under the proposed action, dispersed recreational use and instream wood would be better monitored and Limits of Acceptable Change would be developed so that it would be easier to determine if unacceptable resource damage is occurring and what remedial action(s) (including closure and rehabilitation) would need to occur.

- 5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.**

The Whychus Creek Wild and Scenic River Plan is a programmatic decision and is not associated with ground disturbing activities. Proposed new standards and guidelines in the Plan associated with recreation would help restore the sediment regime by reducing erosion from riverside trails. Consolidating user trails in the riparian area and rehabilitating trails would help reduce the volume of fine sediment input to Whychus Creek. Under the proposed action, dispersed recreational use would be better monitored and Limits of Acceptable Change would be developed for these sites so that it would be easier to determine if unacceptable resource damage is occurring and what remedial action(s) (including closure and rehabilitation) would need to occur.

- 6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing and magnitude, duration and spatial distribution of peak, high and low flows must be protected.**

The Whychus Creek Wild and Scenic River Plan is a programmatic decision and is not associated with ground disturbing activities. The Plan would maintain in-

stream flows because existing and proposed new standards and guidelines would protect existing in-stream flows.

7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

The Whychus Creek Wild and Scenic River Plan is a programmatic decision and is not associated with ground disturbing activities. The Plan would maintain the groundwater elevation because existing and proposed new standards and guidelines would protect existing in-stream flows and channel processes.

8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

The Whychus Creek Wild and Scenic River Plan is a programmatic decision and is not associated with ground disturbing activities. Proposed new standards and guidelines in the Plan associated with recreation would help restore the species composition and structural diversity of plant communities by reducing riparian plant mortality from the creation of user-trails. Proposed new standards and guidelines would limit trails to one side of Whychus Creek and consolidate user-trails into one defined system river trail that could be managed. Under the proposed action, dispersed recreational use would be better monitored and Limits of Acceptable Change would be developed for these sites so that it would be easier to determine if unacceptable resource damage is occurring and what remedial action(s) (including closure and rehabilitation) would need to occur.

9. Maintain and restore habitat to support well-distributed population of native plant, invertebrate, and vertebrate riparian –dependent species.

The Whychus Wild and Scenic River Plan is a programmatic decision and is not associated with ground disturbing activities. Proposed new standards and guidelines in the Plan associated with recreation would help restore habitat for plants and riparian dependent species by reducing riparian plant mortality, landscape erosion, and streambank erosion. Proposed new standards and guidelines would limit trails to one side of Whychus Creek, consolidate user-trails into one defined system river trail that could be managed, and limit access on most river trails to foot traffic. Under the proposed action, dispersed recreational use would be better monitored and Limits of Acceptable Change would be developed for these sites so that it would be easier to determine if unacceptable resource damage is occurring and what remedial action(s) (including closure and rehabilitation) would need to occur.

Fish and their Habitat



Boulder pocket water fish habitat

Outstandingly Remarkable Value *The fish populations of Whychus Creek are an Outstandingly Remarkable Value because of the regional significance of the presence of a native strain of Interior Columbia Basin redband trout with little genetic influence from hatchery fish and the reintroduction of federally listed “Threatened” steelhead.*

The fish habitat in the Wild and Scenic reach of Whychus Creek is also an Outstandingly Remarkable Value because its largely unaltered habitat is a key area for the survival and recovery of steelhead which have been reintroduced. Before runs were interrupted by the construction of Pelton/Round Butte Dam, Whychus Creek in its entirety is estimated to have provided approximately 50% of the available spawning habitat in the Upper Deschutes basin. It is considered the most significant tributary in the Upper Deschutes basin for steelhead reintroduction. The Wild and Scenic River corridor contains the mountain headwaters and upper reaches of this important habitat.

Existing Condition

Fish Populations

Whychus Creek contains a native strain of Interior Columbia Basin redband trout with little genetic influence from hatchery fish. Redband trout are on the Oregon Department of Fish and Wildlife and Regional Foresters Sensitive Species List for Region 6. This population has never had hatchery rainbow trout planted into it which is unusual in the Interior Columbia Basin and is regionally significant.

With the construction of dams downstream and the dewatering of lower portions of the creek through irrigation use for the last 100 years, this population has been essentially cut off from intermixing with the Deschutes River and lower Whychus Creek redband. The population has been confirmed to be a native population with very little hatchery influence (Phelps et al. 1996). Redband trout occur throughout the entire scenic segment from the gauging station to the wilderness boundary and extend up into the wild segment of the creek to just downstream of Chush Falls. In a 1997 survey between the gauging station and Chush Falls, species composition was found to be 93% redband trout and 7% brook trout (Dachtler 1997).

Historically, the Wild and Scenic River segment of Whychus Creek was used by steelhead (the anadromous form of rainbow trout), redband trout, and possibly bull trout and spring chinook salmon. In the early 1900's the dewatering of Whychus Creek combined with several irrigation diversion dams made fish migration above the town of Sisters difficult. Years with early high spring freshets and snow melt before the diversions were opened up allowed steelhead to migrate upstream past the town of Sisters (Nehlsen 1995). Steelhead historically used the stream for spawning and rearing up to Chush Falls, the first natural barrier. Whychus Creek in its entirety is estimated to have provided approximately 50% of the available spawning habitat in the Upper Deschutes Basin.

Even in 1953, fifty years after irrigation withdrawals began to seriously dewater the stream, the summer steelhead return in Whychus Creek peaked at 1000 adults. This ranked Whychus Creek as the largest run of steelhead in the Upper Deschutes basin that year. The summer steelhead run ended in 1968 when upstream passage was stopped by the Pelton Round Butte hydroelectric project.

Spring chinook salmon are also reported to have spawned in the lower reaches of the creek, however the majority of spawning probably occurred just downstream of the Wild and Scenic River segment. Little information exists about the true potential of Whychus Creek for chinook salmon since inventories were done after major loss of summer flows and irrigation dam construction. Whychus Creek is considered essential fish habitat for chinook salmon under the Magnuson-Stevens Act, which protects the spawning and rearing habitat for commercially significant ocean fish species.

Bull trout may have once been present in Whychus Creek and it has been speculated that the diversions on Pole Creek and Snow Creek may have cut off needed spring-fed inflow for this species (USFS 1998). The irrigation dams and dewatering would have also cut off migration access from the Deschutes River. As flows are restored from Snow Creek and Pole Creek and migration barriers are removed, there may be increased use by bull trout of the Wild and Scenic River segment.

The new federal license for Pelton/Round Butte dams has begun to change the story of extirpated fish runs on the creek. The new license provides for reintroduction of steelhead to their historic habitat on Whychus Creek. Reintroduction began on May 12,

2007 when approximately 175,000 fry summer steelhead fry were released in the creek from the confluence with the Deschutes River upstream to Indian Ford Creek. Goals of the release were to assist with studies associated with the re-introduction plan and new fish passage facility at the Pelton Round Butte Hydroelectric Project. The long-term goals are to meet conservation objectives for summer steelhead and provide the presence once again of a federally listed species of regional significance.

Introduced brook trout are present throughout the Wild and Scenic River segment of the creek and are more common in the headwater streams. Above the first falls on East Fork Park Creek and wilderness reaches of upper Whychus Creek only brook trout are found which have been introduced to these streams through the stocking of high mountain lakes by the Oregon Department of Fish and Wildlife. Snow Creek contains only redband trout (USFS 1995 unpublished data) and could be used for spawning by fish from Whychus Creek. There is potential for hatchery rainbow trout from irrigation ponds to move up into Whychus Creek through several unscreened diversion canals and interbreed with the native redband trout.

Fishing pressure in Whychus Creek is very light, with slightly more pressure around the gauging station. The stream offers opportunities to catch small redband trout on a beautiful stream with little to no competition from other anglers. The small size of the fish and low accessibility in the river corridor probably keep most anglers from considering the WSR portion of Whychus Creek as a fishing destination.

Fish Habitat

The cold glacial fed waters from the Three Sisters Mountains mix with waters from several small springs to provide consistently cold water for Whychus Creek throughout the season. The average summer temperature range is 41-52 °F.



Large wood is linked to pool creation, side channel development and cover for fish. Frequencies of large wood in the Wild and Scenic reach of Whychus Creek were generally between 31 and 48 large and medium pieces per mile (over 12 inch diameter, 35 ft long) (Dachtler 1997). The INFISH Riparian Management Objective is a minimum of 20 pieces per mile. The limiting factor for the retention of large wood in-channel is the frequency of high flow events that move the wood downstream. Log jams can form large pools with fish cover in Whychus Creek in reaches that are not confined by bedrock and steep valley walls. Pools are in low abundance (3-5 pools/mile) in the Whychus Wild and Scenic corridor and are highest in the unconfined reach just downstream of the boundary to Rd 4606.

Habitat often changes through the season because of the flashy nature of the stream with periods of high discharge and high turbidity caused by rain on snow events during the fall and winter. Turbid conditions are sometimes present during these events and in the late summer and fall from glacial melt. Periodic high flows most likely change the locations and amounts of woody debris on a frequent basis. This in turn can change the amount and location of slow water fish habitat.

A reach of river in one of the canyon sections (near the Road 1514/900 access) displays plunge pool morphology that provides spawning and rearing habitat for both resident redband trout and steelhead. Quality spawning gravels exist in pockets and in pools throughout the canyon sections. Large substrate boulders throughout the river provide important pocket water habitats.

An area of special interest is the lower-gradient fluvial deposition area fed by several springs that stretches downstream from Road 1514 for 2.1 miles. This area is susceptible to habitat degradation because it does not have the bedrock and boulder substrates that armor much of the rest of the stream nor does it have the protection of wilderness status. This reach may also be important as the uppermost steelhead spawning and rearing area as they are reintroduced to the system. The reach has a lower slope and broad floodplain and is a depositional reach for sediment. Side channels have developed and off channel rearing areas can offer slow water habitats to fish during flood events.

Aquatic and riparian habitat in the Wild and Scenic River segment of Whychus Creek is generally in excellent condition, except in few localized areas of disturbance due to recreational activity. Timber harvest and road building have occurred in the scenic section, however, since much of this segment is in steep inaccessible canyons, few roads have been built near or parallel to the stream. In addition the stream banks are very stable because of the boulder and bedrock substrate in the canyon sections.

Aquatic macroinvertebrate sampling results for Whychus Creek showed lower densities than found in the Metolius River or any of its sampled tributaries (Riehle 1993). More recent information collected near the gauging station during 1989-1999 (Lovtang and Riehle 2000) showed the macroinvertebrate community was not very diverse but had a good representation of water quality sensitive taxa. The lower macroinvertebrate densities combined with cold temperatures and habitat fluctuation from flashy flows may help explain why fish are small and grow slowly in the Wild and Scenic River segments of Whychus Creek.

Environmental Consequences

Alternative 1 - No Action

Management direction in existing plans (Northwest Forest Plan, INFISH, and Deschutes Land and Resource Management Plan) would protect the fish and fish habitat of Whychus Creek to a large extent under the current conditions. The Aquatic Conservation Strategy and Riparian Management Objectives under these plans will generally protect the riparian vegetation and large instream wood important to fish habitat in Whychus Creek.

As recreational use increases in the corridor, priorities in resource management may be inconsistent with the designation of the Outstandingly Remarkable Values under the Wild and Scenic designation. The boundary of ¼ mile may not fully protect and prioritize the management of wetlands and lower tributary reaches for the Fish resource (Pole Creek swamp and other wetlands are not included). Recreation and water uses such as boating may not be fully managed for the full protection of fish habitat. Little improvement to runoff from roads and trails would be expected because little monitoring and corrective measures would be initiated.

Alternative 2 - Proposed Action

The proposed action would have no effect on fish populations, including: Columbia River Bull Trout, Mid-Columbia Steelhead, Interior Redband Trout, or Chinook Salmon or essential fish habitat under the Magnuson-Stevens Fishery Conservation and Management Act.

Boundary changes to include Pole Creek Swamp, Whychus Meadow and low reaches of Snow Creek and the unnamed tributary would increase protection of these habitats for fish habitat management. A new standard to prevent instream wood manipulation by boaters would help protect stream channel habitat.

Recreational uses would be monitored with a defined plan and corrective measures would be more likely to occur to protect and maintain the Fish and Fish Habitat Outstandingly Remarkable Value. Site specific sedimentation sources would be identified and addressed in a timely manner to limit the impact to fish spawning habitat and invertebrate habitat into the future. This alternative would also monitor large wood frequencies and determine if additional protective measures are needed. As recreational uses increase, monitoring of roads, trails and large wood would be an early warning to better prevent fish habitat loss before it occurs.

Cumulative Effects

The increased management of riparian areas, roads and trails under Alternative 2 would combine with other efforts of fish habitat restoration in the watershed. Renewed fish passage at Pelton/ Round Butte dams and at other irrigation dams downstream of the Wild and Scenic Corridor would restore access to upper Whychus Creek. Steelhead, Chinook salmon and bull trout would again be able to access cold water during the warm summer months and be able to use habitats best suited to them during various life stages. Increasing instream flow from water leasing, canal piping and water rights purchases in the reaches downstream of the Wild and Scenic River corridor would increase rearing

capacity of fish in the creek and increase the overall production of anadromous fish the system. Channel restoration projects at Camp Polk and Three Sisters Irrigation District Dam would also increase production in the system and provide connectivity between the Wild and Scenic River corridor and the lower reaches. The combined effects of these projects, including the Whychus Wild and Scenic River Plan, would work together to increase the fish production in Whychus Creek in the next few decades as steelhead and Chinook salmon are reintroduced into the system.

Scenic Resources



Water polished basalt along Whychus Creek

Outstandingly Remarkable Value *The scenic resources of Whychus Creek are found to be an Outstandingly Remarkable Value. The wild, unmodified scenery of the corridor is unique in the region and will become increasingly valuable as it is discovered. The diversity in landscape and scenic elements provided by the change in elevation and varied geologic features result in distinctive scenic features. The headwaters of Whychus Creek, the glaciers on the Three Sisters mountains, are a symbol of Central Oregon and widely photographed. Closer aspects of the creek where the viewer's perspective is focused on the interaction of water, rock and vegetation are diverse and show little evidence of past human activities. Results of this resource assessment validate the legislative history that scenic resources are an Outstanding Remarkable Value within the Whychus Creek corridor.*

Existing Condition

Dynamic geological history and hydrological processes over millennia have created the landscape of Whychus Creek. Whychus Creek still remains undeveloped, relatively undisturbed, and a local secret, which makes it especially unique. High clearance vehicles, access by foot or other means, from many small logging roads is the best way to explore this rough country. Vehicle access by passenger cars to the area is limited to only a few roads.

The Whychus Creek Wild and Scenic River corridor with its unique geological and hydrological features, is generally viewed primarily from the immediate foreground

landscape (0-300 feet) and foreground landscape (300 feet to ¼ mile). A few extended vistas to the Three Sisters mountains can also be found.

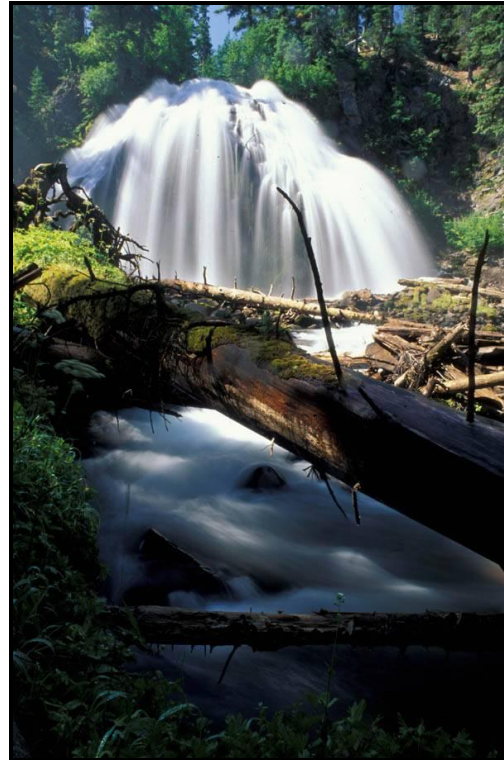
Wild Segment:

Throughout the Wild segment of Whychus Creek, alpine forests of mixed conifers, lush riparian communities, bright alpine grasses, mossy banks, and colorful wildflower species provide texture and variety. The predominant trees are mountain hemlock, spruce, and lodgepole pine, with occasional white fir, Douglas-fir, and ponderosa pine mixed in at lower elevations. These trees create a canopied corridor and create a sense of going through a tunnel or canyon. The variety of riparian communities more prominent at lower elevations, add strong color and textural elements to the landscape viewshed.

Chush Falls and Upper Chush Falls provide outstanding scenic features in this segment and are the most visited sites on the creek. These two waterfalls are the most photographed spots in the river corridor and appear regularly in visitor publications. Basalt outcropping along the corridor wall and in the creek offer dramatic backdrops to water views. In some areas, these rocks and boulders are worn down by the erosive and polishing action of water flows and form smooth, shiny, and sculpted forms.

Unmanaged use and user trails, especially around Chush Falls and Upper Chush Falls have increased greatly in recent years, reducing their scenic integrity.

Changes in scenery from natural disturbance factors such as, wildfires and insects are part of the areas ecology. They have caused changes to scenery and have a distinctive character which may not meet people's sense of place expectations.



Chush Falls



Large high impact wilderness camp near Chush Falls

Scenic Segment:

As Whychus Creek meets Soap Creek near the Three Sisters Wilderness boundary, the canyon widens in some areas opening views into the forest and distant landscape. Vegetation patterns at this lower elevation change as well. Ponderosa pine forests are present with views to older pine with golden reddish bark and younger black barked trees with low green canopies. Remnant old growth ponderosa pine and Douglas-fir provide strong scenic elements along certain sections of the creek. The riparian communities become much more abundant, adding to the strong seasonal color and textural elements of streamside views.

To enter the river corridor within more confined stretches requires a descent from a plateau of dry conifer forests into a canyon or gorge-like environment. Along with the gradual change in temperatures and moisture, there are scenic elements such as towering cliffs and boulders, more variable plant associations including hardwoods with seasonal variations in color, water cascades, and channel appearance. With only minor changes in location, the viewer can experience very diverse and contrasting landscapes. Vegetation patterns are framed by cliffs, outcrops, and boulders.

Sculpted basaltic outcroppings are abundant along this stretch. Pillars, water carved caves, textured canyon walls, and polished potholes, sculpted from water action can be viewed from the creek's banks. Gravel of all sizes, shapes and colors can be found within this stretch adding even more variety to the closer views of the creek.



Precipitous view of Whychus Creek

Past forest management has affected scenic quality in some areas by removing large trees or clearcutting leaving stumps and skid trails. Suppression of fire has left most stands overly dense and slow to develop desirable large old ponderosa pine and Douglas fir trees which are a trademark of the area.

Areas of concentrated use in this segment generally increase closer to the City of Sisters. Impacts that detract from the areas scenic integrity are concentrated near roads and dispersed camping areas. Negative scenic elements include: devegetated dispersed camping sites, trees injured by chopping or cutting, garbage, human waste, graffiti, and multiple or eroding user trails and roads.

Photos below are examples of how unmanaged and illegal use in the Whychus Creek Wild and Scenic River area affects scenic quality: Clockwise from top left: Sisters City Manager Eileen Stein examines a dumpsite, trash left at a devegetated dispersed site, graffiti in a significant cultural site, illegal cutting of streamside trees.



Environmental Consequences

Alternative 1 - No action

The scenic quality of the area would remain generally high. However, unregulated camping, dispersed use, and illegal behaviors would continue to impair the scenery and may increase with population growth in the future. Damage to the landscape from unmanaged recreation causing user trails and roads is likely to increase. Soil loss and trampled vegetation are more likely to be evident in Alternative 1 than in Alternative 2. As recreational use increases in the corridor, a need for minimal management controls such as parking areas, signs, and relocating or developing trails will also increase. This may lead to priorities in resource management to control recreation use that may be inconsistent with the protection of the Scenery resource.

Existing management direction would protect the scenery of Whychus Creek during vegetation management activities. The existing Visual Quality Objectives of

“Preservation” and “Retention” would continue to require a high degree of sensitivity and mitigations such as rapid clean-up and low stumps in vegetation management activities. The boundary of ¼ mile may not fully protect scenic meadow areas and may be difficult to locate on the ground during management activities. Little improvement to the visual effects of unmanaged recreation would be expected because little monitoring and corrective measures would be initiated leading to an increased amount of negative direct impacts to scenic resources.

Alternative 2 - Proposed Action

The scenic quality of the area would remain generally high and immediate foreground (300 feet) of views in high use areas should improve. Monitoring and management of dispersed camping, trails, and parking should provide better detection of illegal behaviors and reduce soil loss and trampled vegetation. Fewer user trails and roads would occur because of management controls. Volunteers assisting with stewardship and cooperative partnerships would help leverage recreational funding to focus management priorities.

Management direction would protect the scenery of Whychus Creek during vegetation management activities. The existing Visual Quality Objectives of “Preservation” and “Retention” would continue to require a high degree of sensitivity and mitigations such as rapid clean-up and low stumps in vegetation management activities. The transition to the Scenery Management System is defined by new standards and includes human interaction as part of the landscape ecosystem. The proposed boundary fully protects scenic meadow areas and is easier to locate and enforce during management activities. Monitoring would better track visually detracting elements.

Cumulative Effects

Past management which has affected scenery in the cumulative effects analysis area (the Whychus Watershed) over the past 100 years includes: timber harvest, livestock use, big game grazing, fire suppression, wildfires, unmanaged recreation, stream diversion, stream restoration, road closures, and trail and road construction. In general, these actions caused a decline in scenic quality in some areas due to heavy ground disturbance, devegetation, or removal of important scenic elements such as large old growth trees. Fire suppression has allowed forests to become more dense and sometimes diseased with mistletoe or insects outbreaks, obscuring and altering immediate foreground and foreground landscape views. Large expanses of lodgepole pine trees are dead or dying along Rd 16 towards Three Creeks Lake. A large wildfire in Park Meadow created a landscape patch of dead trees which is visible from across Central Oregon.

Recent Forest Service streamside restoration activities within the cumulative effects analysis area have improved scenic quality by reducing riparian trampling and devegetation, defining access and closing stream fords at 59 sites along Whychus Creek. Boulders appear somewhat natural but in some areas where they were not buried due to cultural site concerns or where numerous, they may not appear natural to some viewers.

Little vegetation management has occurred in the cumulative effects analysis area in the past 15 years. Foreseeable future actions in the next 5 years that may change scenic quality include: 1) Sisters Area Fuels Reduction Project (SAFR) approved in 2009 and the Popper Vegetation Management Project, currently being planned which would result in short-term scenic effects from cut trees, ground disturbance, smoke, blackened trees and ground for 1-3 years after burning. Long term scenic quality would improve as open park-like stands and more natural historic stand conditions are restored; 2) Invasive Plant Control on public lands through the Deschutes/Ochoco Invasive Plant program, which should benefit scenic quality by reducing large populations of invasive weeds along roads and waterways and allowing reestablishment of native wildflowers and grasses.

Increased management controls in riparian areas, reducing densities of unneeded and user roads and trails, along with revegetation under Alternative 2 would combine with other efforts of streamside and forest restoration in the watershed to cumulatively improve visual quality by restoring habitat and reducing impacts from unmanaged recreation.



Sandy Melchiori paints a view of Whychus Creek

Cultural Prehistory



Obsidian flake found near Whychus Creek

Outstandingly Remarkable Value *The prehistory of the Whychus Creek Wild and Scenic corridor is an Outstandingly Remarkable Value. The depth of time for use of this corridor and the relationship with the high Cascade obsidian sources makes this a unique and significant resource on a regional scale for understanding and interpreting the prehistory of the region. The proposed corridor also contains several sites that have been determined eligible for inclusion to the National Register of Historic Places. Results of this resource assessment validate the legislative history that prehistory or archeological resources are an outstanding remarkable value within the Whychus Creek corridor.*

Existing Condition

The Whychus Creek corridor has a long history of use by Native Americans. There are twenty-five known locations of prehistoric resources within the Wild and Scenic River corridor. The high density of known prehistoric sites and the diversity of projectile point types indicate a regular recurring use of this creek as a travel corridor to and from the obsidian sources in the High Cascades in the Three Sisters area. As such, this drainage provides an important piece of the over-all picture of how people in past times utilized both resources and the landscape from year to year.

Very little in depth analysis has occurred on the prehistoric resources from this area. A few projectile points have been analyzed for obsidian sourcing and hydration. Additional research is possible to gain a better understanding of when past peoples used the Whychus creek corridor and what activities they were engaged in.

Heritage resource inventories have surveyed approximately one-third to one-half of the Wild and Scenic River corridor, so undiscovered sites are highly likely to occur. Six prehistoric sites in the corridor have been determined as eligible for the National Register of Historic Places, while another nineteen have not been evaluated. There has been no subsurface data from controlled excavations on any of the sites.

The Whychus House Cave site on Whychus Creek is of cultural significance to the Confederated Tribes of the Warm Springs Reservation. In the past 10 years the cave has been repeatedly vandalized with graffiti, garbage, and by people breaching road closures to access the cave for parties. Increasing use by hikers, campers, rock climbers, and parties is exposing the site to more vandalism. Climbers are leaving visible chalk trails along the cave rim. Access to the site has been reduced by a road closure and volunteer river stewards have been monitoring and cleaning up garbage at the cave for the past year. Graffiti was removed by powerwashing with water in the summer of 2009, however new graffiti appeared within a month.

Cultural prehistoric resources are being affected by lack of monitoring and management controls. Two sites along the creek are experiencing erosion through the site area. One is getting runoff from an adjacent road that is creating an erosional channel through the site to Whychus Creek. The other site is below a plantation that was planted 20-30 years ago. Water from the plantation is eroding the site.

Much of the Whychus Wild and Scenic River corridor has not been inventoried for heritage resources. Because the creek vicinity has been left undeveloped and primitive there have been few projects requiring inventories. Some additional survey near the creek would assist in determining the extent and location of heritage resources in the Wild and Scenic corridor and help determine best management of the resources before damage starts to occur. The need for coordination and consultation with the Confederated Tribes of Warm Springs continues and may increase as use in the area grows.

Environmental Consequences

Alternative 1 - No Action

The default boundary does not include Pole Creek Swamp, a wet meadow of cultural significance. Unmanaged use and light or occasional monitoring is resulting in damage to some prehistoric sites and culturally significant sites. Rock climbing, camping, campfires, and illegal activities such as graffiti at Whychus House Cave is damaging the site despite access controls and increased monitoring and cleanup. Communications with the Confederated Tribes of Warm Springs are generally limited to project planning.

Alternative 2 - Proposed Action

Developing boundaries and additional management direction for the Whychus Wild and Scenic River would benefit significant and unevaluated cultural prehistoric resources by reducing impacts of unmanaged use and increasing programmed monitoring. By including Pole Creek Swamp in the river corridor this wet meadow, which may have historically supported cultural plants important to the Tribes, would be better protected. New standards and guidelines which emphasize protecting heritage resources would provide guidance for management and volunteer stewardship. Eliminating rock climbing, camping and campfires at Whychus House Cave would reduce visual and physical impacts of trampling, climber's chalk, and smoke to the site. Guidelines to emphasize increased communication with the Confederated Tribes of Warm Springs would increase interactions outside project planning and allow more to improve the relationship between the Tribes, the Forest Service, the community, and visitors and provide opportunities for cross cultural learning, respect, and understanding.

Any site specific projects planned to be implemented within the Wild and Scenic River corridor requires consideration of effects on heritage resources and consultation with the Oregon State Historic Preservation Office.

Cumulative Effects

Past management which has affected prehistoric resources in the cumulative effects analysis area (the Whychus watershed) over the past 100 years includes: timber harvest, wildfires, unmanaged recreation, looting of cultural sites, and trail and road construction. In general, these actions damaged prehistoric resources by affecting site integrity with heavy ground disturbance, when artifacts were removed, or when sites were defaced with graffiti.

Recent Forest Service streamside restoration activities within the cumulative effects analysis area have protected prehistoric resources by avoidance and reducing erosion to sites by reducing riparian trampling and devegetation, defining access, and closing streamfords at 59 sites along Whychus Creek. Boulders in some areas were not buried due to cultural site concerns.

Little vegetation management has occurred in the cumulative effects analysis area in the past 15 years. Foreseeable future actions in the next 5 years require mitigations such as avoidance to protect prehistoric resources including: 1) Sisters Area Fuels Reduction Project (SAFR) approved in 2009 and the Popper Vegetation Management Project, currently being planned 2) Invasive Plant Control on public lands through the Deschutes/Ochoco Invasive Plant program. As population growth and use increases prehistoric resources may experience more vandalism or inadvertent damage.

Increased management controls in riparian areas, roads and trails, and increased monitoring under Alternative 2 would combine with other efforts of streamside and forest restoration in the watershed to cumulatively protect prehistoric resources and reducing impacts from unmanaged recreation.

Cultural Traditional Use



Whychus Creek was “The way to the mountain”

Outstandingly Remarkable Value *The traditional use of the Whychus Creek Wild and Scenic corridor is an Outstandingly Remarkable Value. River-related resources of the creek including hydrology, fisheries, and prehistoric use relate to tribal ceded lands, treaty rights, and Native American history. Traditional use is well documented on the creek by the origin of one of its historic names, which documents Native American women camping along the creek in the 1870’s.*

Existing Condition

The Whychus Creek Wild and Scenic River corridor is within the ceded lands of the Confederated Tribes of Warm Springs. Tribal elders have shared that the creek was a route to the mountains used by generations to reach hunting grounds and other mountain resources. The area has a known historic association with Paiute tribes. Warm Springs Tribal elders also report that many tribes used the area on their way to the Klamath area or the ocean.

The story of how the creek got its original name of “Squaw Creek” is one indication of its traditional use as a camping area for Native American tribes (see “Name Changes” in Chapter 1). After hearing the story, Tribal elders said that people would often camp for 2-3 days in one place and the men would go out hunting while leaving the women in camp.

The Confederated Tribes of Warm Springs have declared their interest in treaty protected resources of the creek including wildlife, reintroduced anadromous fish, hydrology, prehistoric sites, and cultural significance. Tribal elders have also identified the wet meadows as important sites that may have historically contained cultural use plants.

Environmental Consequences

Alternative 1 - No Action

The default boundary does not include Pole Creek Swamp, a wet meadow of cultural significance. Unmanaged use and light or occasional monitoring is resulting in damage to treaty protected resources of the creek. Communications with the Confederated Tribes of Warm Springs are generally limited to project planning.

Alternative 2 - Proposed Action

Developing boundaries and additional management direction for the Whychus Wild and Scenic River would benefit treaty protected resources of the creek by reducing impacts of unmanaged use and increasing programmed monitoring. By including Pole Creek Swamp in the river corridor this wet meadow, which may have historically supported cultural plants important to the Tribes, would be better protected. Guidelines to emphasize increased communication with the Confederated Tribes of Warm Springs would increase interactions outside project planning and allow more to improve the relationship between the Tribes, the Forest Service, the community, and visitors and provide opportunities for cross cultural learning, respect, and understanding.

Cumulative Effects

Past management which has affected traditional use resources in the cumulative effects analysis area (the Whychus watershed) over the past 100 years includes: timber harvest, livestock use, big game grazing, fire suppression, wildfires, unmanaged recreation, looting of sites, the damming and diversion of streams, and trail and road construction. In general these actions caused a decline in traditional use resources when actions damaged prehistoric resources were damaged, when artifacts were removed, and when sites were defaced with graffiti. In addition, Treaty protected resources such as vegetation, wildlife, fish, and water were damaged when activities caused heavy ground disturbance, devegetation, or removed important resources such as large old growth trees or when fish barriers or water diversions affected fish populations. Fire suppression has caused forests to become more dense and sometimes diseased with mistletoe or insects outbreaks, affecting forest health and wildlife habitats for important game such as deer.

Recent Forest Service streamside restoration activities within the cumulative effects analysis area have protected traditional use resources by reducing erosion by reducing riparian trampling and devegetation, defining access and closing streamfords at 59 sites along Whychus Creek. Boulders in some areas were not buried due to cultural site concerns. Riparian habitats which are important refuges for wildlife are improving under this management action.

Little vegetation management has occurred in the cumulative effects analysis area in the past 15 years. Foreseeable future actions in the next 5 years that could affect traditional use resources include: 1) Sisters Area Fuels Reduction Project (SAFR) approved in 2009

and the Popper Vegetation Management Project, currently being planned which would result in Long term benefits to forest health and wildlife habitats as open park-like stands and more natural historic stand conditions are restored; 2) Invasive Plant Control on public lands through the Deschutes/Ochoco Invasive Plant program, which should benefit traditional use resources by reducing large populations of invasive weeds along roads and waterways and allowing reestablishment of native wildflowers, shrubs, and grasses, many of which are plants of cultural significance. As population growth and use increases traditional use resources may experience more vandalism or inadvertent damage.

Downstream watershed restoration efforts such as the Three Sisters Irrigation Dam project which will restore fish passage and improve water flows and the Camp Polk Meadow Restoration combined with concerted efforts to improve flows in Whychus Creek will aid in the recovery of anadromous fish such as salmon and steelhead which are so important to the Tribes.

Increased management controls in riparian areas, roads and trails, and increased monitoring under Alternative 2 would combine with other efforts of streamside and forest restoration in the watershed to cumulatively improve the condition of traditional use resources and reduce impacts from unmanaged recreation.

Wildlife



Pygmy owl and pocket gopher

Significant Value -

Wildlife populations and habitat along the Whychus Creek corridor are Significant, but not an Outstandingly Remarkable Value.

There is a diversity of wildlife in the corridor. Most are typical of faunal species found within other river systems in Central Oregon.

The Late Successional Reserves associated with

the river are part of an important network of old forests. The Northern

Spotted Owl was identified as the focal species to guide management of these late successional reserves. Aspen and cottonwoods areas are also significant habitats.

Existing Condition

The Whychus Creek area supports a variety of wildlife populations. Most are typical of faunal species found within other river systems in Central Oregon. Although the creek offers a variety of aquatic and terrestrial habitats, the area does not contain nationally or regionally important or unique habitats or populations of wildlife species.

Threatened, Endangered and Sensitive Wildlife

Lands managed under the Northwest Forest Plan associated with the Scenic portion of the creek have been inventoried for the spotted owl. Approximately 12 acres of spotted owl nesting, roosting, and foraging habitat occurs within the scenic boundary. During the 2009 field season, a response from both a male and female spotted owl was detected. Upon further monitoring, no nesting was confirmed.

No bald eagle nest sites are associated with the Wild or Scenic segments of the creek. The creek is fish bearing and general observations of bald eagle have been documented in the lower 1/3 of the Scenic portion of the river. Due to the gradient of the creek and lack of large deep pools, foraging habitat is minimal to non-existent.

Wolverine habitat exists within the entire Wild section of the creek. Wolverine are very solitary animals susceptible to human disturbance and avoid fragmented habitat; however will cross clear cuts but avoid dense plantations and shrub fields. Carnivore camera

monitoring occurred during the winters of 1997 and 1998. The location of the monitoring occurred within the scenic portion of the river corridor directly adjacent to Wilderness and the area of the river designated as Wild. No wolverines were detected.

Pacific fisher have not been detected on the Sisters Ranger District. They primarily use mature, closed canopy coniferous forests with some deciduous component, frequently along riparian corridors. They are known to use harvested forest areas but this is not their optimal habitat. (Csuti et al. 1997). The upper 1/3 of the Scenic corridor provides potential habitat for the fisher as well as Wild portion of the river corridor.

White-headed woodpeckers select for both live and dead ponderosa pine. They will forage on both, and are tied to large diameter pines because they often have more seeds and make more suitable nesting habitat. These woodpeckers are poor excavators and generally select for more moderately decayed or softer snags in which to nest (Dixon 1995). This species will utilize smaller trees and snags if larger snags are uncommon. Fire suppression has resulted in increased shrub cover which has led to an increase in small mammal and avian predation on white-headed woodpeckers (Frenzel 1999). This woodpecker species habitat can also be an indicator of goshawk, flammulated owl, pygmy owl, and white-breasted nuthatch habitat. White-headed woodpeckers are identified in the Conservation Strategy for Landbirds of the East-Slope of the Cascades Mountains in Oregon and Washington as a focal species for Ponderosa Pine Forests (Altman 2000) and is a Deschutes National Forest Sensitive Species. The majority of the lower scenic portion associated with ponderosa pine stands, provides habitat for the white-headed woodpecker.

Habitat for the Lewis' woodpecker, a migrant in this part of its range, includes old-forest, single-storied ponderosa pine. Lewis' woodpeckers feed on flying insects and are not strong cavity excavators. They require large snags in an advanced state of decay that are easy to excavate, or they use old cavities created by other woodpeckers. Nest trees generally average 17 inches to 44 inches (Saab and Dudley 1998, Wisdom et al. 2000). The Lewis' woodpecker is identified in the Conservation Strategy for Landbirds of the East-Slope of the Cascades Mountains in Oregon and Washington as a focal species for ponderosa pine forests with patches of burned old forest (Altman 2000). As a substitute for burned trees the Lewis' woodpecker is also known to nest in stream courses that contain hardwoods, such as aspen and cottonwood, nesting in cavities. Whychus Creek provides ample opportunities to forage due to the hatches of aquatic insects. The lower scenic portion associated with ponderosa pine stands, as well as are containing overstory cotton wood and aspen provide habitat for the Lewis' woodpecker.

Big Game

Large mammals inhabiting the area include mule and black-tailed deer, Rocky Mountain elk, cougar, and black bear with mule deer populations being the greatest. The lower segment of the river (east of the Wild and Scenic River Boundary) contains the important Tumalo mule deer winter range; however the Wild and Scenic corridor is transition range. The entire segment of Wild and Scenic is within the Upper Deschutes Management Unit for mule deer. The management unit objective is 6,200 mule deer. The

role of the river corridor as a migratory corridor for mule deer is limited in areas due steep cliff walls, however large drainages such as Whychus Creek provide visual cues for migrating mule deer to follow seasonally. The importance of the river corridor for deer is primarily associated with the riparian zone and the terrain. Deer with fawns are dependent on nutritious vegetation while they are lactating, as well as cover to hide their fawns as they move up the corridor to summer range. Although the riparian zone is narrow and does not provide good cover, deer will utilize the steep slopes of the drainage by bedding against the slope, utilizing it to provide protection from the rear and to more easily detect predators that are approaching from below. The dense shrubs and stands of trees also provide some hiding cover within the drainage.

The lower portion of the river corridor, in the Scenic section, starting at the Gauging Station up to Pole Creek Swamp, is biological winter range and transition range for mule deer (T.15 S. R. 9 E. Sections 35, 36 and T.15 S., R.10 E., Sections 31, 32). Although the Deschutes National Forest Land and Resource Management Plan provides management direction under Management Area 17 (for Wild and Scenic Rivers) it does not recognize or provide any special winter range management guidance within the biological mule deer winter range in this area.

Other Species

Furbearers found in the area include American marten in the upper elevations, raccoon, mink, bobcat, and weasels. Potential exists for beaver presence due to the amount of hardwoods along the Whychus Creek. Many species of small mammals can also be found.

Several raptor species can be found along the corridor including red-tailed hawks, northern goshawk, bald eagles, great-horned owls, and northern saw-whet owls. There is one known northern goshawk territory overlapping the corridor. There are no known bald eagle nest sites within the corridor however, incidental foraging by bald eagles occurs.

Other bird species likely to be located include several species of woodpeckers (pileated woodpecker, Williamson's sapsucker, and northern flicker). Many other bird species have been documented or their habitat exists within the corridor.

Bat species are likely to inhabit the area as well. Although no formal surveys have been conducted, the following species are likely to occur: western big-eared bat, pallid bat, little brown bat, long-eared bat, California myotis, and big brown bat.

Cascades frogs, Pacific tree frogs, and western toads have also been documented in the area.

Wildlife Habitat

Wildlife habitat varies from the upper reaches of the Wilderness to the lower elevations of Whychus Creek. The elevation ranges from approximately 8,000 feet to around 3,600 feet near the gauging station. Topography varies from flats to steep incised channels and slopes. The corridor receives little human activity along the majority of the creek due to topography. However, along stretches in the flats, human use increases.

The corridor is mostly forested with scattered meadows and special habitats. Plant associations transition from high-elevation lodgepole pine to mixed conifer communities to ponderosa pine communities in the lower elevations. Riparian habitat is usually found in a very narrow band and is represented by patches of hardwoods including aspen, willow, and cottonwood species.

Riparian areas in the lower section provide habitat for mule deer fawning. However, due to the level of human disturbance, this may have decreased. Backwater areas and side channels also provide habitat for amphibians.

Hardwoods (aspen, cottonwood, and willow) provide needed forage for big game as they are leaving winter range grounds and provide habitat for bird species like the Red-naped sapsucker and various warblers. This habitat type is decreasing due to conifer encroachment, herbivory, and compaction from past uses and is important to restore.

Old growth ponderosa pine occurs primarily within the riparian corridor. Much of the uplands were previously harvested and consist of single-aged stands of ponderosa pine. Old growth, especially along the creek, provide day roost habitat for bat species. It also provides habitat for focal species like the white-headed woodpecker and flammulated owl. Old growth ponderosa pine is a limited habitat type within the corridor and should be protected and restored. About one third of the corridor is located in Late Successional Reserves under the Northwest Forest Plan, recognized as areas important to maintain functional old growth and late successional forest ecosystems and related species.

Mature and old growth mixed conifer stands are located in the mid section along both sides of the Wild river boundary. This provides habitat for species like the northern goshawk and pileated woodpecker. One known goshawk territory overlaps with the corridor. Upper elevations have experienced higher levels of mortality due to insects and disease. Increased levels of down woody material are providing habitat for species like marten and bobcat.

Meadows such as Pole Creek Swamp and Whychus Creek meadow are found along the corridor. These special habitats provide habitat for a variety of species like the great gray owl and some amphibians.



Whychus Creek Meadow



Rock Spires and Talus Habitat

Whychus Creek has many rocky features including rimrock, boulders, rock spires, and talus. Rimrock and areas consisting of andesite shale provide habitat for western big-eared bats and pallid bats in cracks and fissures in the rocks. Rock spires provide perch sites and forage sites for many raptors while talus and boulder habitat, especially in the upper elevations of the wilderness, provide potential foraging and denning habitat for wolverine. However, talus habitat associated with the project boundary is very narrow and wolverine use would be incidental.

Roads and Wildlife Habitat

Road density currently exceeds Deschutes National Forest Land and Resource Management Plan guidelines according to the Whychus Watershed Assessment Update (USFS 2009). The Update recommends evaluating closure and decommissioning of roads including rehabilitation to benefit wildlife habitat and security, particularly for mule deer and elk.

Below are issues associated with human influences as they relate to roads and trails identified in the Whychus Watershed Assessment Update (2009).

Roads and Trails

- Reduce habitat
- Increase habitat fragmentation
- Increase disturbance (noise from motorized traffic, recreational use)
- Facilitate recreational access (motorized and non-motorized) into wilderness and core habitats
- Reduce connectivity for dispersal
- Increase edge habitat beneficial for a few species
- Facilitate competition with non-native species
- Result in vehicle-strike injury and mortality
- Facilitate legal and illegal hunting
- Increase habitat degradation through soil and water contamination

Studies on ungulates and carnivores have shown heavily traveled roads are avoided or used little in comparison to lightly traveled roads (Forman et al. 2003; Rowland et al. 2005). Wisdom et al. (2005) found similar results for elk but not necessarily for deer. In a study looking at spatial partitioning between elk and deer, Wisdom et al. (2005) found elk were generally farther from roads with traffic rates as low as ≥ 1 vehicle/12 hours

during day and nighttime hours while deer were found closer to roads. In addition, another study conducted by Wisdom et al. (2005) on the effects of off-road recreation on mule deer and elk, showed elk had greater flight probabilities and movement rates for all four off-road activities measured (off highway vehicles, mountain biking, horseback riding, and hiking) compared to no human activity. Elk reactions were more pronounced during the off highway vehicles and mountain biking activities than to horseback riding and hiking. Lyon (1979) reported the area of avoidance for elk is generally $\frac{1}{4}$ to $\frac{1}{2}$ mile from a road, depending on the amount of traffic, road quality, and density of cover near roads.

Rowland et al. (2005) reported habitat fragmentation was the primary effect of roads on elk. This is because there are fewer patches of cover large enough to function effectively (Rowland et al. 2000). Another study (Rowland et al. 2004) documented three main direct impacts on elk as:

- Elk avoid areas near roads.
- Elk vulnerability to mortality from hunter harvest, both legal and illegal, increases as open road density increases.
- In areas of high road densities, elk exhibit higher stress levels (Rowland et al. 2005) and energetic costs of moving away from roads may be substantial (Cole et al. 1997).

In contrast, Wisdom et al. (2005) found mule deer showed little measurable response to off-road activities. Movement rates were slightly increased during all off-road activities except during off highway vehicle use. Stankowich (2008) and Krausman et al. (2006) showed similar responses of mule deer. They found humans on foot have more impact than other stimuli (vehicles, noise, horseback) studied.

In another study by Yarmoloy (1988 in Ouren et al. 2007), mule deer disturbed by off highway vehicles altered their patterns of foraging and use of habitat while deer in undisturbed areas did not. Yarmoloy found disturbance of deer resulted in decreased reproductive success (fewer fawns) while undisturbed deer showed no change in reproductive success.

Although there are other species of interest within the Scenic section of the river that could be affected by roads and trails, the majority of wildlife research on motorized and non-motorized recreation has been associated with carnivores and ungulate populations. Species of ungulates and carnivores are also identified as Management Indicator Species (MIS) within the Deschutes National Forest Land and Resource Management Plan. These species were selected because they represent other species with similar habitat requirements. Management indicator species can be used to assess the impacts of management activities for a wide range of wildlife species with similar habitat needs (FSM 2620.5).

Environmental Consequences

Alternative 1 - No Action

The default boundary does not include Pole Creek Swamp, a wet meadow important to wildlife. Currently, the adjacent land allocations within the Northwest Forest Plan and Deschutes Land and Resource Management Plan provide management direction for the scenic portion of the Whychus Creek corridor. The entire wild section of Whychus Creek is within a congressionally withdrawn Wilderness area and wildlife habitat is managed by natural processes.

Within the scenic section, the Deschutes Land and Resource Management Plan and Northwest Forest Plan provide existing direction for the management of wildlife and wildlife habitat. However, under the no action, the following issues are not addressed by current direction:

- Unmanaged recreation in portions of the river corridor reduce wildlife habitat by physically reducing/removing vegetation, as well as displacement of wildlife from disturbance.
- Road densities within the current boundary of the scenic section exceed forest standards and guides, fragmenting habitat, and contribute to wildlife disturbance.
- Management of the last mile of the scenic section does not address mule deer winter range.

Alternative 2 - Proposed Action

The modified boundary includes Pole Creek Swamp, a wet meadow important for wildlife. Existing guidelines in the Northwest Forest Plan, Aquatic Conservation Strategy and the Deschutes Land and Resource Management Plan are adequate to protect the wildlife resource. However, to improve clarity, management, and enforcement several new standards and guidelines for the Whychus Wild and Scenic River boundary are proposed in Alternative 2. These would help clarify which actions would be allowed and in what locations of the Wild and Scenic boundary.

Under Alternative 2, the Whychus Wild and Scenic boundary would be modified to use topographic features and roads to define the boundary while including wildlife habitat connected by riparian areas and adjacent uplands. Defining the boundary based on real on-the-ground features would make project implementation and enforcement of the Wild and Scenic Plan standards and guidelines easier.

Under Alternative 2, current road densities are 4.44 miles per square mile. Where future opportunities exist to reduce road densities, roads will be prioritized on the basis of maximizing wildlife refugia, by creating un-roaded areas. Revegetation of reclaimed roads will also accelerate habitat recovery providing additional useable habitat.

Alternative 2 gives site specific direction on any proposed future recreation development as well as management guidance for dispersed recreation. Any future recreation

development will be planned with the intent to avoid Riparian Habitat Conservation Areas, riparian reserves, and maximize undisturbed areas that provide or enhance wildlife refugia. Types of recreation include both motorized and non-motorized.

Within the lower 1 mile of the Scenic river corridor, specific standard and guides from the Deschutes National Forest Land and Resource Management Plan for mule deer winter range will be applied. These standards and guides will provide future direction for projects proposing vegetation management activities in this area.

Cumulative Effects

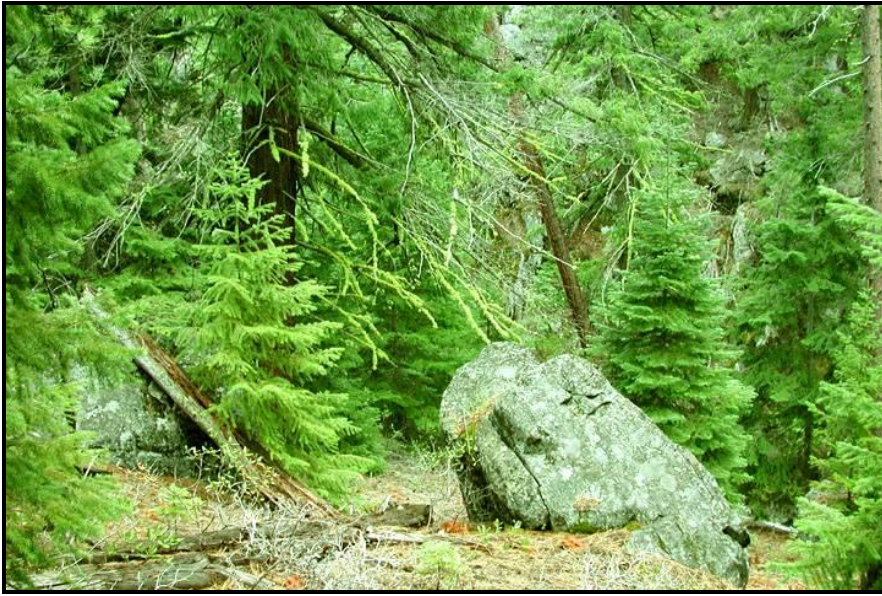
Past management which has affected wildlife and their habitats in the cumulative effects analysis area (the Whychus Watershed) over the past 100 years includes: timber harvest, livestock use, big game grazing, fire suppression, wildfires, unmanaged recreation, stream diversion, stream restoration, road closures, and trail and road construction. Timber harvest has removed the majority of large trees in accessible areas and fire suppression has caused forests to become more dense and sometimes diseased with mistletoe or insect outbreaks affecting habitat quality and quantity for species dependent on certain structural stages of forest such as old growth. Fire suppression has also reduced habitat quality for forest dwelling species, affected riparian plant species diversity, and reduced the size of meadows. Lack of summer water in riparian habitats due to stream diversions below the Wild and Scenic River boundary have reduced the quality and quantity of this limited habitat which is disproportionately important for many wildlife species for food, water, and shelter.

Few wildfires and little vegetation management have occurred in the cumulative effects analysis area in the past 15 years. Foreseeable future actions in the next 5 years focus on restoring forest conditions by thinning smaller trees and reintroducing fire. These include the Sisters Area Fuels Reduction Project (SAFR) approved in 2009 and the Popper Vegetation Management Project, currently being planned which would result in more sustainable forest conditions and wildlife habitats in the long term.

Invasive plant control on public lands through the Deschutes/Ochoco Invasive Plant Program is also a foreseeable future action which should benefit wildlife habitats by reducing populations of invasive weeds along roads and waterways in the analysis area and allowing reestablishment of native plants used as food or shelter by wildlife.

Recent Forest Service streamside restoration activities within the cumulative effects analysis area have begun to improve riparian and forest condition by reducing riparian trampling and devegetation, and by defining access and closing stream fords at 59 sites along Whychus Creek. Increased management controls in riparian areas, along roads and trails, and revegetation of unneeded roads under Alternative 2 would combine with other efforts of streamside and forest restoration in the watershed to cumulatively improve wildlife habitat conditions and habitat quality by restoring habitat and reducing impacts from unmanaged recreation.

Ecology/Botany



Moist microclimate supporting a Mixed Conifer Forest in Whychus Creek Canyon

Significant Value *The ecological and botanical values of Whychus Creek are Significant, but not an Outstandingly Remarkable Value. Although the elevation and precipitation gradient for the Whychus Creek corridor are recognized as one of the steepest in the region, the plant associations and diversity of plant species are typical of many forests within other river systems in Central Oregon. There is one sensitive plant species known from the river corridor, the local endemic wildflower Peck's penstemon. The area provides an important southern edge of habitat for the plant in intermittent stream channels.*

Another significant value is the remnant old growth ponderosa pine and Douglas fir trees which survive in inaccessible streamside areas. Old growth trees have declined across the region. Two significant wet meadows also occur near the stream, Pole Creek Swamp and Whychus Creek Meadow. Meadows are limited and important habitats on the eastside of the Cascades. Whychus Creek Meadow appears to have little alteration and contains few non-native species, which is unusual. The late successional reserves associated with the creek are part of an important network of old growth forests. Aspen and cottonwoods areas are also significant habitats.

Existing Condition

The Whychus Creek Wild and Scenic River area contains a variety of plant habitats and associations tied to the steep elevation and precipitation gradient found between the glacial headwaters at around 8,000 feet to the lower elevation forests at about 3,600 feet. The elevation and precipitation gradient for the Whychus Creek corridor are recognized as one of the steepest in the region, however forest types in the Whychus Creek Wild and

Scenic River area are typical of many forests areas and not particularly diverse in the area of comparison. About one third of the corridor contains Late Successional Reserves under the Northwest Forest Plan, recognized as areas important to maintain functional old growth and late successional forest ecosystems and the related species.

High Elevation Forests

High elevation forests in the Wild section of the corridor transition from wet mixed conifer to lodgepole pine to mountain hemlock dominated forest types. Historic fire return intervals increase with elevation as do expected fire intensities. Higher elevation forests close to the wilderness boundary should experience infrequent stand replacing fires at intervals from 100 to 150 years. Fire intervals exceed 200 years at the highest elevations near timberline.

Approximately 11% of high elevation forests in the area have experienced high mortality from mountain pine beetles, so that 30-100 trees per acre are dead. Mortality is moderate (10-30 dead trees per acre) in 34% of these forests. There has been little or no logging because most high elevation forests are in wilderness or in Inventoried Roadless areas (USFS 2009).

The exclusion of fire has changed species composition and structure. Acres dominated by trees over 21" diameter at breast height (dbh) have increased by 11%. Acres of high elevation old growth forests have increased by 24%. Forests are dominated by more mountain hemlock and true firs because of fire suppression. Fire suppression has created larger patch sizes of late successional forests which may burn in wildfires of uncharacteristic size in the future, as occurred in the higher elevations of the 2003 B&B Wildfire (USFS 2003).

Lodgepole Pine Forests

In the middle reaches of the Wild section of the river corridor and lower section of the Scenic river corridor, high elevation forests transition to lodgepole dominated forests.

Approximately 54% of lodgepole pine forests in the watershed have experienced high mortality from an outbreak of mountain pine beetle mountain pine beetles, so that 30-100 trees per acre are dead (USFS 2009). Historic fire return intervals were between 100 to 150 years. Lodgepole pine forests are generally within the historic range of variability and are subject to a wide range of conditions from natural boom and bust cycles of insects and fire. Exclusion of fire has increased habitat instability and vulnerability to disturbances such as insects, disease and fire. Approximately 60% of lodgepole pine forests are at unstable densities.

There has been a small loss of large old lodgepole pine trees due to logging and the exclusion of fire. There are fewer large trees and more small trees. Acres dominated by lodgepole pine trees over 21" dbh have decreased by 9%. Acres dominated by trees between 5 - 20.9" dbh have increased by 95%.

Mixed Conifer Forests

The upper reaches of the Scenic River corridor there is a mosaic of wet and dry mixed conifer forests. Diverse types of tree species continue along the entire river in moist microclimates generated by the creeks influence on humidity in areas such as steep and narrow canyons, near waterfalls, and adjacent to caves and rocky features. These moist microclimates support a variety of moisture loving mosses, lichens, and ferns in the immediate river corridor, as well as tree species such as Douglas fir, western hemlock, and lodgepole pine.

Historically mixed conifer forests experienced a range of fire frequencies and fire intensities dependant on slope aspect and microclimate. Historic fire return intervals ranged between 30-50 years. As in lower elevation forests, there has been a loss of large old trees due to logging and the exclusion of fire. Acres dominated by trees over 21" dbh have decreased by 75-80%. Acres of old growth dry and wet mixed conifer forests have decreased by 63-79%. Forests are dominated by smaller average tree sizes than those that occurred historically. Acres dominated by trees between 5 - 20.9" dbh have increased by 67-74%. Exclusion of fire has increased habitat instability and vulnerability to disturbances such as insects, disease and fire. Approximately 45% of wet mixed conifer forests and 73% of dry mixed conifer forests are at unstable densities with too many small trees (USFS 2009).

Ponderosa Pine Forests



Lower elevation forests in the Scenic portion of the corridor are dominated by ponderosa pine with stringers of mixed conifer in moist microclimates. Historically these forests were maintained in a more open condition by frequent low intensity fires every 4-25 years.

Fire suppression and past logging practices have greatly reduced the historic dominance

of large ponderosa pine trees over 21" dbh that once occurred. Analysis in the Whychus Watershed Analysis and Update (USFS 1998 and 2009) indicate that acres dominated by trees over 21" dbh have decreased by 79%. Forests are dominated by smaller average tree sizes than those that occurred historically. Acres dominated by trees between 5 - 20.9" dbh have increased by 81%. Exclusion of fire has increased habitat instability and vulnerability to disturbances such as insects, disease and fire. Approximately 64% of pine forests are at unstable densities with too many small trees. Fire suppression and harvest have also reduced the quantity and quality of open ponderosa pine forest habitats

which support plant species like the rare Peck's penstemon wildflower, and wildlife including white-headed woodpeckers, and the northern goshawk (USFS 1998 and 2009).

The Whychus Creek Wild and Scenic River corridor is significant because of the remnant old growth ponderosa pine and Douglas fir trees which survive in inaccessible streamside areas where logging was limited. Historically, periodic fire was an important disturbance agent in the river corridor and surrounding forests. Streamside areas may have burned at lower intensities or more infrequently, but fire was certainly a frequent event every 1-35 years and most large old trees near the stream bear fire scars.

Riparian Habitats and Meadows

There are a variety of riparian plant association along the creek including shrubs such as spirea, red osier dogwood, and willow and a variety of wildflowers and grasses. Stringers of hardwood trees such as aspen and cottonwoods are found near the stream and are significant habitats recognized to be in decline across the region. Natural disturbances such as fire, flooding and beaver activity which rejuvenate riparian habitats have been reduced by human intervention. This has affected the vigor of streamside trees and shrubs. This has also caused a decline in aspen trees. Riparian habitats have been also been degraded by fire suppression and logging. Less than 1% of the watershed has riparian areas dominated by large trees. There is less down wood and large live and dead trees in riparian areas due to past logging and this reduces its habitat value for plants, wildlife and fish (USFS 1998 and 2009).

Riparian habitats are key habitats for many wildlife species. Approximately 200 species found or suspected to occur on Sisters Ranger District use riparian for breeding, roosting or foraging (USFS 1998).

Two significant wet meadows occur in the Scenic section of the corridor, Pole Creek Swamp and Whychus Creek Meadow. Natural meadows comprise a very small percentage of the landscape and are high probability habitats for rare species and cultural use plants. Whychus Creek Meadow appears to have little hydrological alterations and contains few non-native species, which is unusual since most meadows were drained to facilitate grazing and often seeded. No cultural use plants have been found in these meadows but could have occurred historically. Pole Creek meadow has been affected by water diversion. Fire suppression has caused meadows to shrink in size as trees grew in the absence of fire and encroached into meadow edges. High probability unsurveyed habitats for several sensitive or otherwise rare species could occur in the meadow and swamp and adjacent to small springs. Particularly, bryophytes (mosses and liverworts) are poorly known across the region and there is likely additional biodiversity in the area that is undiscovered (USFS 2009).

High elevation meadows in the Wild section of the corridor, such as Park Meadow and Red Meadow appear to have generally intact hydrological regimes. The Park Meadow area burned in 1996. Wilderness meadows were kept more open by periodic fires and are now being invaded by trees where fires have been excluded. Wildfires can change

meadow hydrology, making them wetter as evapotranspiration by trees ends if they die. Large stands of insect killed trees will also lead to wetter conditions for the same reason.

Cattle, sheep or horse grazing occurred historically in high elevation meadows, but not in the past 30 or so years. Some horse grazing may occur associated with recreational horse use near Park Meadow and Red Meadow. Grazing can change species composition. Meadows are favorite recreational areas for camping. Excessive recreational use can cause trampling, devegetation, introduce invasive plant species and change species composition.

Sensitive Plant Species

No threatened or endangered plant species have been found in the corridor. Some high probability habitats for sensitive plant species is predicted in unsurveyed areas.

Peck's penstemon There is one population of Peck's penstemon known from the river corridor. This rare endemic wildflower is classified as "sensitive" on the Regional Forester's Sensitive Plant List. It is only found on approximately 485 square miles centered around Black Butte on the Sisters Ranger District. Most known populations are on National Forest Lands. The one population of Peck's penstemon in an ephemeral drainage of Whychus Creek, is the southernmost population in the plant's global range. Populations on the edge of the plant's range are particularly important to the viability of the species because they may contain important genetic variation. This population is managed as "Protected" which means only management actions known to benefit the plant would be allowed.



Peck's penstemon is an indicator of fire maintained habitats, including open canopy patch patterns, meadows, and the integrity of seasonally moist habitats or channels. It is closely associated with pine-dominated, open-canopied forests with early seral understories. These habitats were historically maintained by a low intensity fire regime. The plant has wide genetic amplitude and can be found persisting in a variety of habitats, including early seral habitats such as plantations, skid trails, and roadsides. It often occurs in high water table areas or in intermittent and ephemeral stream channels.

The Peck's Penstemon Species Conservation Strategy Update (Pajutee 2009) identifies the five most important abiotic and biotic variables involved in the plant's viability as abundant moisture, light (required for flowering), abundant pollinators, periodic fire, and flooding (seed dispersal).

Exclusion of fire from pine and dry mixed conifer forests has been the biggest factor in reducing habitat quality for the plant. Severe ground disturbance can uproot plants and

destroy populations. Timber harvest is a threat to penstemon populations when the type of the treatment involves heavy soil disturbance, heavy fuels are left behind the treatment, the timing of the treatment ignores the condition of the population and plant phenology or when a majority of the plants are not preserved during the treatment. The potential for introduction of invasive plants on logging equipment or support vehicles and the spread of existing invasive plants into newly disturbed areas is also a risk.

It is the hypothesis of Peck's Penstemon Species Conservation Strategy Update (Pajutee 2009) that heavy ground disturbance in penstemon populations that are under closed canopy conditions before treatment may fragment or permanently destroy the population because the soil seed bank is low and conditions that allow successful germination and seedling survival may be rare. The population in the Whychus Wild and Scenic River area meets these criteria in that it is under a closed canopy and has minimal flowering.

Timber harvest activities which occur before yearly seed dispersal may lower the recovery rate of the population if slash is not cleaned up. This is because there are known chemical inhibitors for Peck's penstemon seed germination in pine needle litter slash left behind timber harvest. This indicates slash from timber harvest activities should be burned or removed to benefit the plant.

Not all timber harvest has resulted in loss of penstemon plants or populations. When parent plants are not uprooted, the species has been observed reseeding and proliferating in adjacent bare soil areas and skid trails. It is speculated that silvicultural treatments which open closed canopies, reduce soil litter, reduce vegetative competition, and retain penstemon parent plants will benefit the species in forested habitats. These treatments have not yet been tested in controlled situations, and the effects of new logging equipment, which causes less soil disturbance, needs to be studied.

The Botanical Report for the Whychus Late Successional Reserve Update (Pajutee 2009) lists the following recommendations for this population of Peck's penstemon. Additional guidelines can be found in that report:

- Consider allowing fires to burn through the Peck's penstemon population area and potential habitats for resource benefit.
- Avoid fireline, safety zones, or equipment in population areas.
- Consider hand thinning and prescribed fire in the population area to increase flowering.
- Do not burn concentrations of slash on top of population.

Invasive Plant Species

The Whychus Creek Wild and Scenic River Corridor is relatively free of invasive species. Invasive plants such as diffuse knapweed and dalmatian toadflax are found in low levels scattered along roads adjacent to or leading to the creek including Road 16 and along the creek edges below the Wild and Scenic River boundary. Management activities that open stands, such as thinning and prescribed fire, have a risk of creating more habitats for weed invasion.

Environmental Consequences

Alternative 1 -No Action

The default boundary does not include Pole Creek Swamp, a wet meadow of ecological significance. Standards in existing management direction are generally adequate to protect significant vegetation and ecological values. However, lack of clarity on wildfire use and wildfire suppression may allow unintended impacts to vegetation.

Alternative 2 -Proposed Action

The modified boundary includes Pole Creek Swamp, a wet meadow of ecological significance. Standards in existing management direction would continue to protect significant vegetation and ecological values. New standards to manage trails and recreational would detect and reduce impacts on vegetation and habitat. Clarification of wildfire use and suppression standards would reduce unintended impacts on vegetation. Programmed monitoring helps detect problem areas.

Cumulative Effects

Past management which has affected vegetation in the cumulative effects analysis area (the Whychus Watershed) over the past 100 years includes: timber harvest, livestock use, big game grazing, fire suppression, wildfires, unmanaged recreation, stream restoration, road closures, and trail and road construction. Timber harvest has removed the majority of large trees in accessible areas and fire suppression has caused forests to become more dense and sometimes diseased with mistletoe or insects outbreaks. Fire suppression has also reduced habitat quality for rare species such as Peck's penstemon, affected riparian species diversity, and reduced the size of meadows.

Few wildfires and little vegetation management have occurred in the cumulative effects analysis area in the past 15 years. Foreseeable future actions in the next 5 years focus on restoring forest conditions by thinning smaller trees and reintroducing fire. These include the Sisters Area Fuels Reduction Project (SAFR) approved in 2009 and the Popper Vegetation Management Project, currently being planned which would result in more sustainable forest condition in the long term. These activities have the risk of introducing invasive plants and mitigations are required.

Invasive Plant Control on public lands through the Deschutes/Ochoco Invasive Plant program is also a foreseeable future actions which should benefit vegetation by reducing large populations of invasive weeds along roads and waterways in the analysis area and allowing reestablishment of native wildflowers and grasses.

Recent Forest Service streamside restoration activities within the cumulative effects analysis area have begun to improve riparian and forest condition by reducing riparian trampling and devegetation, by defining access and closing streamfords at 59 sites along Whychus Creek. Increased management controls in riparian areas, roads and trails, along

with revegetation of unneeded roads with native plants under Alternative 2 would combine with other efforts of streamside and forest restoration in the watershed to cumulatively improve vegetative conditions and native plant habitat quality by restoring habitat and reducing impacts from unmanaged recreation.

Cultural History



Sisters Rodeo Association 1946- Courtesy of Georgia Gallager

Significant Value *-The historical resources in the Whychus corridor are Significant but not an Outstandingly Remarkable Value. The primary historical use of the corridor area for grazing, hunting, and logging, although significant on a local scale, are not of outstanding regional or national importance or rarity.*

Existing Condition

The primary historic use of most of the Wild and Scenic River corridor of Whychus Creek was for summer grazing of sheep and sometimes cattle. The historic grazing in this vicinity was wide spread and utilized alpine meadows and mid elevation forested areas. Some logging and hunting activities also occurred. Most of the significant historic uses along the creek were downstream from this section and included water diversion for irrigation and municipal use and for settlement. A good portion of the length of Whychus Creek in the Wild and Scenic corridor is very steep and rocky so not highly conducive to grazing access or use.

There are three recorded locations of historic activity. Two of these sites are related to grazing activities and include a corral and drive line. The third is an agricultural implement at a high elevation lake. There have been no evaluations for the National Register of Historic Places.

Environmental Consequences

Alternative 1 - No Action

The existing boundary and standards in existing management direction are generally adequate to protect cultural history. Monitoring is informal.

Alternative 2 - Proposed Action

A modified boundary would not affect any known historic sites. New standards to manage trails and recreational would reduce impacts on historic sites. Programmed monitoring helps detect problem areas

Cumulative Effects

Past management which has affected historic resources in the cumulative effects analysis area (the Whychus Watershed) over the past 100 years includes: timber harvest, wildfires, prescribed fires, unmanaged recreation, looting of historic sites, and trail and road construction. In general, these actions damaged historic resources by affecting site integrity with heavy ground disturbance, or when artifacts were removed or burned.

Recent Forest Service streamside restoration activities within the cumulative effects analysis area have protected historic resources by avoidance.

Little vegetation management has occurred in the cumulative effects analysis area in the past 15 years. Foreseeable future actions in the next 5 years that could affect historic resources include the Sisters Area Fuels Reduction Project (SAFR) approved in 2009 and the Popper Vegetation Management Project, currently being planned which would result in long term benefits by restoring the historic character of the landscape toward open park-like stands. As use increases historic sites may experience more vandalism or inadvertent damage.

Increased management controls in riparian areas, roads and trails, and increased monitoring under Alternative 2 would combine with other efforts of streamside and forest restoration in the watershed to cumulatively protect historic resources and to reduce impacts from unmanaged recreation.



Wooden Wheels at the Billy Wilson Mill Site

Recreation



Hikers along Whychus Creek

Significant Value *The recreation opportunities in the Whychus corridor are Significant but not an Outstandingly Remarkable Value. Whychus Creek's primitive character, lack of crowds and variety of settings are attractive but there is limited access, no recreation facilities in the area, and few trails. People are not attracted from beyond the region and use is light. The area is not frequented by the casual visitor. Although the area provides important recreational opportunities it is not in a unique niche. This undeveloped character and the ability for self discovery is valued and is what attracts people to the area.*

Existing Condition

Whychus Creek's primitive character is recognized as unusual on the Sisters Ranger District and the Deschutes National Forest. Recreational developments on the creek such as trails and campgrounds were avoided because of the risk of a flood from a breach of the Carver Lake glacial moraine dam. This acted to preserve the primitive character of the creek and has made it more difficult to access than many other waterways on the Forest .

The creek and its environment provide an opportunity for quieter, reflective experiences in a wild setting that provides for self- discovery outdoor activities. The creek's recreational values were rated as Significant but not Outstandingly Remarkable because although the area does provide for a variety of recreation experiences, it does so in a way that is not as prominent as in other Wild and Scenic Rivers in the Region and it generally does not attract visitors from outside the region, unlike rivers like the Metolius. This may change as Central Oregon grows and the area is discovered.

There are no developed recreation facilities in the Whychus Creek Wild and Scenic River corridor. Recreation uses include: dispersed camping, driving for pleasure, photography, viewing scenery, snowmobiling, picnicking, hiking, riding horses, mountain biking, on and off road motorized use, and hunting. A few boaters use the creek during high water flows and rock climbers have several climbing spots on cliffs along the creek.

There is only one trailhead, to Chush Falls, providing access to the Three Sisters Wilderness, and one system trail for hikers, equestrians, and mountain biking, the Metolius/Windigo, that crosses the corridor. The area is not frequented by the casual visitor, but more-so by locals. The farther from the town of Sisters one travels up Whychus Creek, the greater the sense of remoteness that comes to the traveler.

The Wild Segment of Whychus Creek

The Wild segment of the creek is within the Three Sisters Wilderness area. A hiking trail provides access to the Wilderness and portions of Whychus Creek. The short day hike to Chush Falls is the most popular recreation spot on the creek. An overlook along the trail provides a spectacular view of the falls. Recreation use is low- moderate but can be steady during the hot summer months. The trail to Chush Falls is in fair shape, however the end of the trail that accesses the overlook is devegetated and eroding. User trails around Chush Falls and Upper Chush Falls have increased greatly in recent years, affecting the desired setting and causing erosion and devegetation. The road to the Chush Falls Trailhead is in poor condition.

Popular wilderness destinations such as Park Meadow, have been identified as having overused campsites. Wilderness users and Field Rangers have reported other areas in the wilderness with eroding user trails and large high impact campsites.

The Scenic Segment of Whychus Creek

The Scenic segment of the creek is primarily accessed by Road 1514 which crosses the creek below the wilderness boundary. Most recreational users are driving for pleasure along Road 1514 or using the area for dispersed camping accessed by roads. There is little trail access into the area. The Metolius/Windigo trail provides the only system trail access through the Scenic segment and is popular with horse users and mountain bike use is also allowed.

Roads and Motorized Use - There is limited vehicle access into the area and the creek which has helped to maintain its primitive character. Some of the primitive forest roads along the creek are used by hikers, mountain bikers, snowmobilers, motorcyclists, and motorized vehicles. Roads that access the creek are used primarily by dispersed campers. Though most roads are out of the stream corridor, some user made roads and dispersed campsites are within riparian habitat. Several system roads are usable by passenger cars in the late spring through fall and provide motorists with mountain panoramas and large ponderosa pine for viewing and photography.

Snowmobilers cross the area on Cross District Snowmobile Trail. A deteriorated snowmobile bridge which crossed the creek was removed several years ago after it became unsafe for use. Snowmobile users have expressed interest in replacing the bridge to provide access across the creek in an area which receives reliable snow pack.

Current road densities exceed recommended densities. Only 7-10% of the roads receive any type of annual maintenance. Implementation of the 2005 Travel Management Rule is proposed to be implemented 2010. Publication of the associated National Motor Vehicle Map would close motorized use on all but designated routes and aid in enforcement of off road use. Over the snow winter use would not be affected.

Dispersed Camping – Dispersed camping is concentrated near the gauging station, Road 900, and near the Road 1514 bridge across Whychus Creek. Some sites are large with devegetated areas. The Forest Service has recently made efforts to reduce some of the sedimentation and riparian effects from roads and dispersed camping (See Hydrology). The Whychus Creek Riparian Protection Project (2005-2007) reduced user created roads and fords and closed or pulled back dispersed camping areas at the edge of Whychus Creek. The intent was to provide a limited number of quality dispersed camping opportunities and a more pleasant non-motorized experience that would protect important fish and riparian habitat along the creek. A total of 59 sites were protected which resulted in the closure of 1.1 miles of system roads and the closure of an unknown amount of user created roads. Illegal breeching of these road closures in on-going (see Hydrology). Publication of the National Motor Vehicle Map would establish additional provisions to limit motorized access to dispersed camping.

Rock Climbing Rock climbing occurs on several rock cliffs along the river corridor and has been identified as an activity that could affect the Geology resource which is one of the Outstandingly Remarkable Values of the creek. Climbing use is light now, but is likely to increase.

As with all dispersed recreation, if only a few local climbers are climbing on the rocks then very little damage would be done to the rock. However, if use increases then it could affect the Geology resource. Generally, climbers use a white chalk to dry their hands while rock climbing. The chalk leaves a white “trail” on the rock. This “trail” is not very noticeable with only a few climbers but creates marks on the rocks. Some popular spots show signs of chalk buildup on rock faces and vegetation is trampled. As use increases this could present an eye sore to others enjoying Whychus Creek. Most climbers do not hammer metal hardware into the rocks, however if done, could affect geological features. Trails exist to and around the rock outcrops. As use increases these trails could lose more vegetation and widen as use increases. Some climbers also “garden” or remove plants and moss from their climbing routes. High levels of rock climbing could create sanitation problems. At some point, it may be necessary to consider safety measures for the climbers, like placement of litters for emergency evacuation, if the use increases. The use has not been well monitored. Local climbers have expressed interest in area stewardship and are likely to be future partners.

Boating Kayaking and creek boating (a subset of whitewater kayaking where paddlers seek narrow streams, fast currents and waterfall drops) occurs in the upper reaches of the creek during high water flows. Currently a small number of people enjoy this challenging sport. The dynamic nature of Whychus Creek's flows moves instream wood into an ever-shifting arrangement of structure in the creek. This wood poses hazards to boaters. However, if wood was removed to allow boat passage it could remove important structure that stabilizes stream banks and creates fish habitat.

Special Uses and Events Special uses are defined by the Code of Federal Regulations (36 CFR, 251.50) as all uses of National Forest lands, improvements, and resources, except those provided for under other regulations for timber, grazing, or minerals. Before engaging in a "Special Use" people must submit an application and receive a permit unless that requirement is waived by an authorized official. Special uses include permits for commercial and noncommercial users as: outfitter guides, educational groups, commercial recreational providers, and wilderness therapy for teens. The Whychus Wild and Scenic River area currently has approximately 20 Special Use permittees that utilize portions of the Three Sisters Wilderness that overlap with some portions of the Wild Segment of the river boundary. One irrigation diversion exists on Pole Creek within the proposed Wild and Scenic boundary. No changes in the management of the ditch are expected through this plan.

Two authorized non-motorized recreational events currently occur: 1) The Peterson Ridge Rumble, a running event with up to 300 people which has occurred for several years and uses portions of non-system user created trails to access the creek, and 2) The Poker Run which uses portions of user created trails as well as the Metolius/Windigo Trail. No fixed improvement special use permits currently exist however Road 16 adjacent to the corridor is a utility corridor for phone and electric lines.

Population Growth and Unmanaged Use

In the past decade, unmanaged, careless, and illegal uses in the Whychus Creek Wild and Scenic River area have accelerated with population growth. The populations of Sisters and Deschutes County have increased greatly in the past decade and continue to grow.

In 1990, 708 people lived in Sisters and in 2008 that increased to 1,910. Population growth rates have varied from a high of 32% increase in 2003 to 4.7% increase in 2008. In addition 6-10,000 people live in subdivisions near Sisters. There are an additional 900 undeveloped platted lots in Sisters. Deschutes County continues to grow at a faster rate than other Oregon counties, having the highest percent change from 2007-2008 of any county in Oregon; and having the third largest population change, behind only Washington and Multnomah counties. In 1990 the population was 74,958 and in 2008 it was estimated at 167,051. (Porter, 2009 Growth Data).

Areas near the City of Sisters or with good road access, have been subject to repeated vandalism and misuse including dumping, shooting trees and wildlife, partying and leaving trash, graffiti, driving vehicles through and up the creek, and illegal road and trail building. Some illegal user-made mountain bike trails have been developed along the

creek. Restoration closures have been breeched and educational signs removed, defaced or destroyed. Public comments recognized that the area needs more recreation management and some developed facilities, especially close to the city, because people are building their own trails and creating networks of user trails. Some felt that making the area more accessible for low impact, responsible users would help monitor and displace irresponsible users.

New additions to the Peterson Ridge Mountain Bike Trail system have increased mountain bike use in the creek area. As previous noted there are some illegal, user-made mountain bike trails along the creek with steep erosive pitches. With growth in Sisters there are more horse users in the area and some conflicts with mountain bikes. Off Highway Vehicle use is also increasing, with more user trails, breeching of restoration closures, and damage to resources in the past decade (USFS 2009).

Public and Tribal comments expressed concern that recreation use levels could increase and impacts of unmanaged use would grow. People recommended not over promoting or over developing the area with recreation facilities but providing facilities primarily for resource protection and low impact uses. Increased enforcement, volunteer stewardship, and management will help address the effects of increased population growth and use.

Sustainable Recreation and Volunteer Stewardship

Interest in stewardship by partners and volunteers has greatly increased in the past decade and is essential to long-term Forest Service management of the area. Volunteer River Stewards have been monitoring the gauging station and/or the Whychus Creek House cave area for several years. Volunteers help with wilderness monitoring. Partners such as Wolfree, the Deschutes Land Trust, and the Upper Deschutes Watershed Council have played an active role in education and restoration efforts.

In 2008, the Whychus Creek and Metolius River areas were chosen by the National Forest Foundation for a major capitol conservation campaign to fund restoration, manage use, and promote volunteerism (The Tale of Two Rivers Campaign). Over 100 people attended the National Forest Foundations “Whychus Friends of the Forest Day” in September 2009 to volunteer in clean-up and restoration projects on the creek. A Volunteer Bank of River Stewards is a goal of the campaign.

Environmental Consequences

Alternative 1 -No Action

The existing boundary would exclude the interesting wet meadow, Pole Creek swamp and would be ¼ mile from the creek. Its unmarked location would make it more difficult to locate. The self discovery experience continues with minimal monitoring or controls.

Unmanaged use has caused multiple user trails and roads in some locations, especially near the City of Sisters. Future unmanaged use may lead to more user trails, roads and devegetation. Illegal behaviors such as dumping garbage, graffiti, firewood cutting along

the creek, shooting trees, shooting wildlife outside hunting regulations, are occurring and are expected to continue with occasional monitoring. Rock climbing appears to be increasing slightly and chalk trails are visible on some popular routes. One of these is a cultural resource site which is being damaged by campfires, dumping, and graffiti.

Population increases may lead to more requests for special uses and events that detract from the areas desired character.

Alternative 2 -Proposed Action

The modified Wild and Scenic corridor would include the wet meadow Pole Creek swamp and be easier to locate and enforce because it uses roads and more easily identifiable boundaries. New standards to manage trails and recreational would reduce impacts on the creeks' Outstandingly Remarkable Values and other significant river values while providing for public use and enjoyment.

Users would be impacted by loss of access to some streamside camps, user trails, or roads. Increased management and visitor controls, where needed to protect river resources such as defined parking areas, stable system trails, restrooms, and signing will change people's experience in a few areas. However, scenic and environmental quality may also be improved with less dumping, sanitation issues, and restoration of trampled areas and unneeded routes. Increasing user education by teaching low impact techniques would help reduce effects of recreation use.

Climbing, camping or having campfires at Whychus House Cave, a cultural site would be prohibited. Climbers would be required to use low impact climbing techniques on rock features within the Whychus Creek Wild and Scenic River Corridor and remove chalk. This will affect some climbers methods and inconvenience them.

Promotion of volunteer stewardship would increase recreation program sustainability. Programmed monitoring would help detect problem areas. New standards to define appropriate special uses would help maintain desired resource conditions and social setting while providing noncommercial and commercial opportunities.

Cumulative Effects

Past management which has affected recreation in the cumulative effects analysis area (the Whychus Watershed) over the past 100 years includes: timber harvest, livestock use, fire suppression, wildfires, unmanaged recreation, stream diversion, road closures, and trail and road construction. Timber harvest has removed the majority of large trees in accessible areas and fire suppression has caused forests to become more dense and sometimes diseased with mistletoe or insects outbreaks affecting visual quality and people's sense of place. Unmanaged recreation and the effects of vandalism have affected people's experience by creating a less natural landscape with discordant elements such as multiple trails, garbage, and injured trees and trampled vegetation.

Recent Forest Service streamside restoration activities within the cumulative effects analysis area have improved visual quality by reducing riparian trampling and devegetation, defining access and closing stream fords at 59 sites along Whychus Creek. Boulders appear somewhat natural but in some areas where they were not buried due to cultural site concerns or where numerous, they may appear negative to some viewers.

Little vegetation management has occurred in the cumulative effects analysis area in the past 15 years. Foreseeable future actions in the next 5 years that may change visual quality and affect people's sense of place include: 1) Sisters Area Fuels Reduction Project (SAFR) approved in 2009 and the Popper Vegetation Management Project, currently being planned which would result in short-term scenic effects from cut trees, ground disturbance, smoke, blackened trees and ground for 1-3 years after burning. Long-term scenic quality would improve as open park-like stands and more natural historic stand conditions and wildlife habitat are restored; 2) Invasive Plant Control on public lands through the Deschutes/Ochoco Invasive Plant program, which should benefit scenic quality by reducing large populations of invasive weeds along roads and waterways and allowing reestablishment of attractive native wildflowers and grasses.

Increased management controls in riparian areas, roads and trails, along with revegetation of unneeded roads with native plants under Alternative 2 would combine with other efforts of streamside and forest restoration in the watershed to cumulatively improve visual quality by creating a more natural appearing landscape and reducing impacts from unmanaged recreation. Continuing community volunteerism and stewardship will improve resource conditions.

Other Disclosures

Civil Rights and Environmental Justice

See earlier discussion of the consultation and the involvement of Native American Tribes and the sections of the project analysis which discusses how a Wild and Scenic River Plan will better protect prehistoric and traditional use resources important to the Tribes. There have been no issues or concerns raised with adverse effects to Native American Tribes.

There are no known direct, indirect, or cumulative effects on Native Americans, minority groups, women, or civil rights beyond effects disclosed in the Deschutes Land and Resource Management Plan.

Environmental Justice means that, to the extent practical and permitted by law, all populations are provided the opportunity to comment before decisions are made and are allowed to share in the benefits of government programs and activities affecting human health and the environment.

Executive Order 12898 on environmental justice requires federal agencies to identify and address any disproportionately high and adverse human health or environmental effects on minority and low income populations. The action alternatives would have no

disproportionately high or adverse effects to minority or disadvantaged groups qualifying under the environmental justice order. Scoping and widely circulated media articles have raised no issues or concerns associated with the principles of environmental justice. The action alternatives do not have a disproportionately high and adverse human health effects, high or adverse environmental effects, substantial environmental hazard or effects to differential patterns of consumption of natural resources. All interested parties will continue to be involved with commenting on the project and the decision making process.

Congressionally Designated Areas

This analysis discusses why action is needed and the effects of the project on congressionally designated areas such as the Whychus Wild and Scenic River and the Three Sisters Wilderness. Neither would be adversely affected by the proposed activities. No significant irreversible or irretrievable commitment of resources would occur under Alternative 2 (Proposed Action) because the purpose of the Proposed Action is to protect and enhance the values of the area.

Prime Farm and Forest Lands and Wetlands

The Secretary of Agriculture issued Memorandum 1827 which is intended to protect prime farm lands and range lands. The project area does not contain any prime farmlands or rangelands. Prime forestland is not applicable to lands within the National Forest System. National Forest System lands would be managed with consideration of the impacts on private lands. There would be no direct, indirect, or cumulative adverse effects to these resources and thus are in compliance with the Farmland Protection Act and Departmental Regulation 9500-3, "Land Use Policy." Potential effects to wetlands are extensively discussed in the Hydrology Section of this analysis. The analysis concluded there are no negative impacts of the action alternative to wetlands.

Compliance with Other Polices, Plans Jurisdictions

The alternatives are consistent with the goals, objectives and direction contained in the Deschutes National Forest Land and Resource Management Plan and accompanying Final Environmental Impact Statement and Record of Decision dated August 27, 1990 as amended.

Implementation of Alternative 1 (No Action) or Alternative 2 (Proposed Acton) would be consistent with relevant federal, state and local laws, regulations, and requirements designed for the protection of the environment including the Clean Air and Clean Water Act. Effects meet or exceed state water and air quality standards.

Irretrievable and Irreversible Commitment of Resources

NEPA requires that environmental analysis include identification of "...any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources have on future generations. No significant irreversible or irretrievable

commitment of resources would occur under Alternative 2 (Proposed Action) because none is proposed in this project.

- Irreversible: Those resources that have been lost forever, such as the extinction of a species or the removal of mined ore.
- Irretrievable: Those resources that are lost for a period of time, such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line rights-of way or road.

Consultation and Coordination

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

Interdisciplinary Team Members

Kevin Foss, Recreation Specialist/Field Ranger

Monty Gregg, Wildlife Biologist

Cari Press, Hydrologist

Maret Pajutee, Team Leader/Ecologist

Mike Riehle, Fisheries Biologist

Jan Spencer, Landscape Architect

Barton Wills, Geologist

Donald Zettel, Archeologist

Consultants:

Larry Chitwood, Geology

Nate Dachtler, Fisheries

Kirk Flannigan, Recreation

Leslie Moscoso, Recreation

John Schubert, Recreation

Jeff Sims, Special Uses

Federal, State and Local Agencies

City of Sisters

Oregon Water Resources Department

Sisters/Camp Sherman Fire District

Upper Deschutes Watershed Council

USGS

Tribes

Confederated Tribes of Warm Springs

Others:

National Forest Foundation

References

- Cole, D. N. 1989. Low-Impact Recreational Practices for Wilderness and Backcountry. Intermountain Research Station, General Technical Report INT-265.
- Cole, E.K., M.D. Pope, and R.G. Anthony. 1997. Effects of road management on movement and survival of Roosevelt elk. *Journal of Wildlife Management* 61(4):1115-1126.
- Cordova, J. 1995. Stream side forests, channel constraint, large woody debris characteristics, and pool morphology in low order streams, Blue Mountains, Oregon. MS Thesis. Oregon State University, Corvallis.
- Dachtler, N. 1997. Squaw Creek level II stream survey summary. USDA Forest Service. Deschutes National Forest. Sisters Ranger District. Sisters, OR.
- Dachtler, N. 2009. Whychus Watershed Analysis Update – Fish, aquatic habitat and riparian reserves. Deschutes National Forest. Sisters Ranger District, Sisters, OR.
- Flynn, K.M., Kirby, W.H., and Hummel, P.R., 2006, User's Manual for Program PeakFQ Annual Flood-Frequency Analysis Using Bulletin 17B Guidelines: U.S. Geological Survey, Techniques and Methods Book 4, Chapter B4; 42 pgs.
- Forman, R.T. and D. Sperling, [et al.]. 2003. Road Ecology: Science and Solutions. Island Press. 481 pp.
- Hill, C., M. Logan, and L. Jones. 2008. Whychus Creek Temperature Summary: 2005-2008. Upper Deschutes Watershed Council Technical Report. Bend, OR.
- Inter-Fluve. 2002. Qualitative assessment of sediment transport and downstream channel stability of Squaw Creek near Camp Polk Meadows below the Squaw Creek Diversion Canal. Unpublished report prepared for the U. S. Army Corp of Engineers.
- Krausman, P.R., J. Avey, C.F. Brown, P.K. Devers, J.C. Tull, B.D. Jansen, and J.W. Cain III. 2006. Distances moved by startled desert mule deer. *The Southwest Naturalist* 51(3):436-439.
- Laenen, A., K.M. Scott, J.E. Costa, and L.L. Orzol. 1987. Hydrologic hazards along Squaw Creek from a hypothetical failure of the glacier moraine impounding Carver Lake near Sisters, Oregon: U.S. Geological Survey Open File Report 87-41, 48p.
- Laenen, A., K.M. Scott, J.E. Costa, and L.L. Orzol. 1992. Modeling flood flows from a hypothetical failure of the glacial moraine impounding Carver Lake near Sisters Oregon, in Subitzky, Seymour, ed., *Selected papers in the hydrologic sciences, 1988-92*: U.S. Geological Survey Water Supply Paper 2340, P. 151-164.

Lovtang J. and M.D. Riehle. 2000. Squaw Creek education and restoration project 1998-1999. Deschutes National Forest. Sisters, OR.

Lovtang J. and M.D. Riehle. 2000. Squaw Creek education and restoration project 1998-1999. Deschutes National Forest. Sisters, OR.

Lyon, L.J. 1979. Habitat effectiveness for elk as influenced by roads and cover. *Journal of Forestry* 79:658-660.

McArthur, L.A, and LL. 2003. Oregon Geographic Names, Portland Oregon
Nehlsen, W. 1995. Historical salmon and steelhead runs of the upper Deschutes River and their environments. Portland General Electric Consultant Document.

O'Connor, J.E., J.H. Hardison III, and J.E. Costa. 2001. Debris flows from failures of Neoglacial- Age moraine dams in the Three Sisters and Mount Jefferson wilderness areas, Oregon. US Geological Survey Professional Paper 1606, 93 p.

ODEQ (Oregon Department of Environmental Quality). 2003. Oregon Administrative Rules, Chapter 340, Division 41-Department of Environmental Quality, State-Wide Water Quality Management Plan; Beneficial Uses, Policies, Standards, and Treatment Criteria for Oregon.

www.deq.state.or.us/rules/OARs_300/OAR_340/340_041.html

ODEQ (Oregon Department of Environmental Quality). 2007. Final 2004 303(d) database. www.deq.state.or.us/wq/assessment/rpt0406/search.asp

Ouren, D.S., C. Haas, C.P. Melcher, S.C. Stewart, P.D. Ponds, N.R. Sexton, L. Burris, T. Fancher, and Z.H. Bowen. 2007. Environmental effects of off-highway vehicles on Bureau of Land Management lands: A literature synthesis, annotated bibliographies, extensive bibliographies, and internet resources: U.S. Geological Survey, Open-File Report 2007-1353. 225 pp.

Pajutee, M. 2009, Species Conservation Strategy for Peck's Penstemon Deschutes National Forest, Sisters Ranger District. Sisters Oregon.

Pajutee, M. 2009, Botanical Report for the Whychus Late-Successional Reserve Assessment, Deschutes National Forest, Sisters Ranger District. Sisters, Oregon.

Phelps, S.R., S. Cierebeij, B. Baker and K. Kostow. 1996. Genetic relationships and estimation of hatchery introgression 28 collections of redband trout from the Upper Deschutes River and Crooked River, Malheur Lake Basin and Goose Lake Basin, Oregon. Washington Department of Fish and Wildlife. Olympia, WA

Porter, E. 2009. Growth Data from the City of Sisters Planning Department.

Press, C. 2009. Whychus Watershed Analysis Update – Hydrology Report - DRAFT. Sisters Ranger District, Sisters, OR.

Riehle, M.D. 1993. Upper Metolius Basin Water Resources Monitoring 1988-1992 Progress Report. Deschutes National Forest, Sisters Ranger District. Sisters Oregon.

Rosgen, D. 1996. Applied River Morphology. Wildland Hydrology, Pagosa Springs, Colorado. 380 p.

Rowland, M.M., M.J. Wisdom, B.K. Johnson, and M.A. Penninger. 2005. Effects of roads on elk: Implications for management in forested ecosystems. Pages 42-52 in Wisdom, M.J., tech. ed., The Starkey Project: a synthesis of long-term studies on elk and mule deer. Reprinted from the 2004 Transactions of the North American Wildlife and Natural Resource Conference, Alliance Communications Group, Lawrence, KS.

Senkier, K. 2009. Personal communication. Hydrologist at the Upper Deschutes Watershed Council. Bend, OR.

Stankowich, T. 2008. Ungulate flight responses to human disturbance: A review and meta-analysis. Biological Conservation 141:2159-2173.

USFS. 1990. Deschutes National Forest Land and Resource Management Plan. Deschutes National Forest, Supervisors Office, Bend, OR.

USFS. 1990. Final Environmental Impact Statement, Deschutes National Forest Land and Resource Management Plan. Deschutes National Forest, Supervisors Office, Bend, OR.

USFS and Bureau of Land Management (BLM). 1994. Record of decision for amendments to Forest Service and Bureau of Land Management planning documents within the range of the northern spotted owl.

USFS. 1995. Decision notice and finding of no significant impact for the Inland native fish strategy - interim strategies for managing fish-producing watersheds in eastern Oregon and Washington, Idaho, western Montana and portions of Nevada. Intermountain, Northern, and Pacific Northwest Regions.

USFS. 1996. Landscape Aesthetics: A Handbook of Scenery Management.

USFS and Bureau of Land Management (BLM). 1997. An Assessment of ecosystem components in the Interior Columbia Basin and portions of the Klamath and Great Basins. PNW-GTR-405. U. S. Forest Service, Pacific Northwest Research Station.

USFS. 1998a. General Water Quality Best Management Practices. Unpublished USFS Report. Pacific Northwest Regional Office, Portland, OR. 104 p.

USFS 1998b. Sisters-Whychus Watershed Analysis. Deschutes National Forest. Sisters Ranger District, Sisters, OR.

USFS. 2003. Metolius Watershed Analysis Update. Deschutes National Forest. Sisters Ranger District, Sisters, OR.

USFS. 2004. Draft Upper Deschutes and Little Deschutes Subbasins Water Quality Restoration Plan. Deschutes National Forest, Bend, Oregon.

USFS and Bureau of Land Management (BLM). 2005. Northwest Forest Plan Temperature TMDL Implementation Strategies. Unpublished USFS and BLM report. Portland, OR.

USFS and Bureau of Land Management (BLM). 2007. Compliance with the Aquatic Conservation Strategy. FS-Memorandum, EMS Transmission 05/24/2007, BLM-Instruction Memorandum No. OR-2007-060.

USFS. 2009. Carver Lake Meeting Notes. January 14, 2009. Sisters Fire Hall. Sisters Ranger District, Sisters, OR.

Wisdom, M.J. technical editor. 2005. The Starkey Project: a synthesis of long-term studies of elk and mule deer. Alliance Communications Group, Lawrence, Kansas.

Appendix 1- Whychus Creek Wild and Scenic River MONITORING PLAN

This section identifies activities that will be conducted to assess the progress and results of implementing the Whychus Wild and Scenic River Plan. This monitoring program ensures that effects of projects and activities on river values remain within acceptable levels. This monitoring plan will be a part of the Comprehensive River Management Plan that will be developed after public review and the final decision.

The monitoring and evaluation in this plan are based upon the Limits of Acceptable Change concept (LAC) whenever possible. LAC is based on the premise that change to the ecological and social conditions of an area will occur as a result of natural and human factors. The goal of management is to keep the character and rate of change due to human factors within acceptable levels that are consistent with plan objectives. These limits tie closely with protection and enhancement of the each river's outstandingly remarkable values.

The LAC system places its primary emphasis on the desired resource condition, rather than on how much use an area can tolerate (i.e., carrying capacity). The management challenge with this approach is one of deciding what changes should occur, how much change will be allowed, what management actions are needed to guide and control it, and how managers will know when the established limits are being reached. Therefore this emphasis does not aim to prevent all human-caused change in the corridors, but rather it focuses concern on specific indicators that reflect the carrying capacity in more practical terms.

For each river value to be monitored, one or more key indicators are selected that will allow managers to keep attuned to changes in the ecosystem or social setting. For each key indicator, a threshold is set. This is the value that determines the amount of change that is either desired or that will be accepted before river management objectives are no longer being met. In this manner, indicators and thresholds provide managers with information to determine if the resource values and opportunities they are managing are actually being provided. The standards serve as 'triggers' that cause predetermined management actions to be implemented when the limit is being approached.

For each indicator and standard, a "Actions if Not Met" column lists the likely action that would be triggered if a particular threshold is reached. Sampling methods provide an example of how the indicator might be measured, but these sample methods can and should be changed as better means become available.

Additional monitoring is identified in this section that provides resource inventories or baseline data that is necessary to establish thresholds. River Plan implementation must include the final development of these thresholds where none exist yet.

VALUE	KEY INDICATOR	STANDARD TO MEET	ACTION IF NOT MET	SAMPLE METHODS
Water Quality	Temperature	Temperature levels meet or exceed state water quality standards.	Correct management practices that may be contributing to increase in water temperature.	Continue monitoring stream temperature with continuous recording device at multiple locations in Whychus Creek.
	Sediment Delivery	<p>No net increase in number of stream crossings.</p> <p>No increase to riparian area road densities.</p> <p>No sediment contribution from trails, roads, or campsites.</p>	Identify source of sediment delivery and add drainage or change the alignment if physically and economically feasible. Otherwise, close and restore the road, trail, or campsite to eliminate the sediment source.	Annual survey of riparian trails and roads in the Whychus Wild and Scenic River corridor.

VALUE	KEY INDICATOR	STANDARD TO MEET	ACTION IF NOT MET	SAMPLE METHODS
Scenic Resources	Projects, activities or modifications which alter landform, vegetation, water, or character within the viewshed as seen from the river and high use areas.	Activities within river corridor and viewshed would be evaluated on how well they meet VQOs and SMS standards for river corridor and viewshed. Contrasts created by new management activities would not be allowed if they attract the attention of the casual observer within the characteristic landscape. Short-term impacts such as those created by trail building or prescribed fire would be allowed. Outstandingly Remarkable Scenic Values will be preserved.	Management actions or developments (or proposed developments) not consistent with Wild and Scenic River classifications or scenic resource management objectives will be modified (i.e. screened) or proposals rejected.	Individual projects will be analyzed on a case by case basis to ensure protection of outstandingly remarkable values.

VALUE	KEY INDICATOR	STANDARD TO MEET	ACTION IF NOT MET	SAMPLE METHODS
Vegetation/Ecology	Amount of riparian habitat and wetlands. Proper functioning ecological condition as indicated by vegetative cover and streambank condition. Conifer encroachment. Species diversity.	Riparian vegetation would be managed to maintain or enhance vegetative diversity, biomass, and percent cover at desired level. Specific thresholds will be determined during baseline monitoring to comply with Forest Plan direction.	Remove or eliminate source of impacts (i.e. close campsites, roads, trails, etc.) if inventory assesses extent of impact is unacceptable.	Conduct baseline riparian/wetland resource inventory and photo inventory, starting in 2010. Continue to reassess at 5-year intervals. If funding is limited, at a minimum identify areas of resource damage. Visually monitor recreation and other sites annually for resource damage. If funding allows, establish formal monitoring plots in high use areas.
	Upland Vegetation: Progression towards desired conditions.	Within Whychus LSR, follow criteria for developing appropriate treatments as described in Whychus Late Successional Reserve Assessment. See Whychus Watershed Analysis for vegetation objectives.	Implement activities to restore natural condition or biodiversity.	During project planning, survey vegetation noting species present and condition and soil conditions at project locations. Stand density, snag counts, size and decay classes will be recorded.

VALUE	KEY INDICATOR	STANDARD TO MEET	ACTION IF NOT MET	SAMPLE METHODS
	Populations of noxious weeds and undesirable species.	Prevention, reduction, and eradication of noxious weeds.	Control, restrict, or mitigate human caused activities as necessary.	Survey likely areas on regular basis to determine presence of unwanted vegetation. Heavily used recreation sites should be surveyed yearly. Where possible, enlist private landowners to survey their property for these conditions.

VALUE	KEY INDICATOR	STANDARD TO MEET	ACTION IF NOT MET	SAMPLE METHODS
Fish Habitat	Large wood frequency	Large wood pieces per mile meet or exceed INFISH or watershed analysis standards.	Correct management practices that may be limiting recruitment of large wood.	Continue monitoring large wood frequency in Whychus Creek through periodic surveys.
	Sediment Delivery (Same monitoring standard as in Hydrology section)	<p>No net increase in number of stream crossings.</p> <p>No increase to riparian area road densities.</p> <p>No sediment contribution from trails, roads, or campsites.</p>	Identify source of sediment delivery and add drainage or change the alignment if physically and economically feasible. Otherwise, close and restore the road, trail, or campsite to eliminate the sediment source.	Regular survey of riparian trails and roads in the Whychus Wild and Scenic River corridor.

VALUE	KEY INDICATOR	STANDARD TO MEET	ACTION IF NOT MET	SAMPLE METHODS
Wildlife	Populations of major species Amount and combination of habitat type	Negative change in river corridor use by selected species (i.e. neotropical birds, big game, listed species) No substantial human-caused change in mix of habitat types within the corridor.	Identify cause of change. If human-caused, correct practices or activities.	Conduct wildlife surveys on five year basis to correspond with habitat surveys, starting in 2010. Count and record all nests, raptors, and waterfowl sightings on regularly scheduled surveys. GIS mapping of habitat type and extent using aerial photography interpretation. Establish baseline year and replicate survey every five years.
	Evidence of intrusions on key nest sites. Evidence of loss of winter habitat security.	No substantial evidence of human entry during seasons of concern.	Closure of area to eliminate the conflict.	Identify key areas of concern and then make at least annual walk through surveys of these areas to determine if encroachment occurred. Samples in winter use areas would be expected more often in order to determine any changes to habitat use by specific species, such as wolverine, American marten, etc.

VALUE	KEY INDICATOR	STANDARD TO MEET	ACTION IF NOT MET	SAMPLE METHODS
Cultural Resources	Cultural Resource Site Integrity	No significant cultural resource is being irreparably damaged by human use or eroded by natural forces to the point that it is in danger of being lost.	Conduct damage assessment and develop treatment or mitigation plan to eliminate sources of loss. Execute plans made.	Visit sensitive sites at least annually.
Recreation Experience	Key indicators and standards to be established with implementation of Limits of Acceptable Change (LAC) inventory, survey and analysis.	Established by Recreational Opportunity Spectrum (ROS) standards for desired experience	A combination of indirect (information, education, signing, site design, etc.) and direct (enforcement patrols, site closures, seasonal restrictions, permits, etc.) management actions and controls would be utilized emphasizing in-direct methods first. If above methods are not effective, use may need to be limited through use of permits or other more direct methods of visitor control, especially within Big Marsh, and the wilderness.	Conduct LAC survey and develop monitoring program, repeat every ten years. First survey should be in 2010/11.
	Quality of Experience Potential items most likely to be included are conditions of congestion, use levels, safety hazards, reported incidents of conflict such as site competition, vandalism, and trespass.	Numbers of encounters with other recreationists (groups) per day. Numbers of reported conflicts, trespass/vandalism reports or safety incidents recorded annually. Recreation visitor counts, trail user counts, vehicle counts. Number of days, campsite and parking area capacity exceeded.		

VALUE	KEY INDICATOR	STANDARD TO MEET	ACTION IF NOT MET	SAMPLE METHODS
Dispersed Recreation Sites	<p>Soil Stability</p> <p>Vegetative loss</p> <p>Tree damage</p> <p>Human waste</p> <p>Litter</p> <p>New sites</p> <p>Distance between sites</p>	<p>Impacts to dispersed use areas (camping, trailheads, etc.) will be based on subjective judgment regarding erosion, vegetative change, facility damage, and accumulation of litter as follows:</p> <p>Light: Previous ground vegetation intact allowing natural erosion to occur. Facility damage and litter is not evident. The site has experienced only minimal physical changes.</p> <p>Moderate: Vegetative growth is somewhat retarded allowing minor abnormal erosion to occur. Traces of litter can be found within and adjacent to the site. Minor vandalism, repairable by maintenance, is occurring on facilities such as tables. Physical changes to the site could include: minor tree limbing, movement of rocks and semi-stationary facilities.</p> <p>Heavy: Use area vegetation is gone but adjacent vegetation still intact. Abnormal erosion within the site is correctable through maintenance. Major littering is evident within and adjacent to the site and can be corrected through maintenance. Major vandalism, repairable by maintenance, is occurring on facilities and physical features such as tables, rocks, trees and other site protection facilities. Physical changes to the site could include: moderate tree limbing, beginning tree root exposure, trails radiate from site, human caused changes to the layout of the use area. All impacts to camp and dispersed use areas could be resolved through routine maintenance.</p>	<p>Use basic site protection measures, harden sites to maintain important sites if necessary between moderate and heavy standards. Campsites or day use areas which have received extreme impacts will be rehabilitated and closed until levels of impacts have been mitigated to at least moderate levels. Other actions could include: increased user education efforts, seasonal closures, site or access restrictions, etc.</p> <p>Management actions and controls would be utilized emphasizing indirect methods first, for example:</p> <ol style="list-style-type: none"> 1. Increased user education in "minimum impact" camping techniques (signs, brochures, increased management patrol presence, etc.). 2. Campsite rehabilitation. 3. Use barriers to control traffic. 3. Campfire ban. 4. Designated campsites. 5. Close areas to overnight camping. 	<p>Inventory and assess all existing and proposed sites within the river corridors upon approval of this plan.</p> <p>Remeasure and assess all sites once every three years, or when conditions indicate need.</p> <p>Utilize feedback from routine patrols and biological/wildlife monitoring programs.</p>

VALUE	KEY INDICATOR	STANDARD TO MEET	ACTION IF NOT MET	SAMPLE METHODS
Roads and Trails	<p>Road erosion and damage related to roadside vegetation and facilities.</p> <p>Occurrence of accidents on roads to indicate safety problems.</p> <p>Trail erosion and damage related to trailside vegetation and bare ground.</p> <p>Conflicts between trail users (i.e. hikers, horses, bikes).</p>	<p>Confine motorized use to designated roads. Maintain roads to established federal or state standards.</p> <p>Maintain trails to established federal or Forest standards. Prevent multiple trail or trail networking using indirect methods. Trail use and design will be in keeping with Recreation Opportunity Spectrum (ROS) experience level and visual management standards.</p> <p>Evaluate user made trails for damage to resources, especially for trails potentially being used by ORVs.</p>	<p>Increase road maintenance frequency. Reconstruct/relocate roads, improve bridges, parking areas, trails, and related facilities to resolve unlawful access, resource damage, and road safety problems. Closure of unauthorized roads and trails where resource damage is taking place.</p> <p>Develop, maintain, and replace signing as needed.</p> <p>Increase trail maintenance frequency. Reconstruct/relocate trails to reduce trail networking and encourage appropriate use. Keep trail maps and information current.</p> <p>Actively close trails where unauthorized OHV use is taking place.</p>	<p>Monitor routine road maintenance needs annually. Utilize feedback from visitor contact. Monitor any accident reports on forest roads to identify safety problems.</p> <p>Monitor routine trail maintenance needs annually. Establish monitoring points along high use trails to measure trail depth, width, and drainage. Remeasure points and map inventory trails every five years.</p>